



Indonesian Society of Hypertension
Perhimpunan Dokter Hipertensi Indonesia

PROGRAM BOOK

20th InaSH

SCIENTIFIC MEETING 2026
February 13 - 15, 2026 | Sheraton Grand Gandaria City, South Jakarta

**EMPOWERING COMMUNITIES,
PERSONALIZING CARE OF HYPERTENSION AND
CARDIO-CEREBRO-RENAL COMPLICATIONS**

February 13th - 15th, 2026
Sheraton Grand Gandaria City

Jl. Sultan Iskandar Muda, Kebayoran Lama Utara
Kebayoran Lama, Jakarta Selatan



Welcome Message

Indonesian Society of Hypertension is an organization committed to continuously promote scientific exchange on every aspects of hypertension and its related complications, as the world's largest burden of non communicable diseases. It is through our annual scientific meeting, the stakeholders of hypertension in Indonesia meet to showcase current innovations on clinical, population and basic science research in this field. The meeting provide a dynamic forum for researchers, clinicians, academics, health practitioners and also the industry to discuss current challenges and also forge collaboration with a shared goal of making progress in the subject of blood pressure control. Our annual conference is historically met with enthusiasm of all parties involved, with over 1500 attendees and more than 100 faculty members and research presenters each year.

This year in our 20th of annual scientific meeting, we plan to continue our tradition as the leading scientific event on hypertension in Indonesia, but with a twist. We will transform our platform to a full offline conference.

By engaging with our audience through multiple online platforms, we are confident that The 20th Annual Meeting of Indonesian Society on Hypertension will be able to reach a wider attendance, even in remote corners of Indonesia. We look forward to welcome our industry partners to once again, set up a world class scientific meeting on hypertension in Indonesia together. Join us in this opportunity to become a part of the first offline conference of Indonesian Society of Hypertension.

Regards,



Aryatama, MD
Chairman of the Organizing Committee
The 20th InaSH Scientific Meeting 2026



Prof Rakhmad Hidayat, MD, PhD
Chairman of the Scientific Committee
The 20th InaSH Scientific Meeting 2026

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Organizing Committee

Chairman	: Aryatama, MD
Co - chairman	: Bagus Andi Pramono, MD
Secretary	: Dinda Diafiri, MD
Organizing Committee	
Treasurer	: Ekawati Dani Yulianti, MD

Scientific committee

Chairman	: Prof Rakhmad Hidayat, MD, PhD
Secretary	: David Pangeran, MD
Members	: Arieska Ann Soenarta, MD Pranawa Martosuwignyo, MD Adre Mayza, MD Tunggul D. Situmorang, MD Prof Yuda Turana, MD, PhD Erwinanto, MD Eka Harmeiwaty, MD Antonia Anna Lukito, MD, PhD Djoko Wibisono, MD A. Sari S. Mumpuni, MD Afiatin, MD, PhD Siska Suridanda Danny, MD

Workshops	: Dimas Septiar, MD Paskariatne Probo Dewi Yamin, MD Celly Anantaria Atmadikoesoemah, MD Abdul Wahid Indrajaya, MD
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Young Investigator Award	: Prof Saifur Rohman, MD, PhD Prof Syahrul Gazali, MD, PhD Maruhum Bonar Marbun, MD, PhD Bambang Widyanoro, MD
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Poster	: Ni Made Hustrini, MD BRM. Ario Soeryo Kuncoro, MD Amanda Tiksnadi, MD Artaria Tjempakasari, MD Rossana Barack, MD
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Organizing Committee

Trigger Quiz	: Cep Juli , MD I Made Putra Swi Antara, MD Anandhara Indriani, MD Dina Elita, MD
Publication	: Badai Bhatara Tiksnadi, MD Adrianus Kosasih, MD Tities Anggraeni Indra, MD Zicky Yombana, MD
Exhibition	: Assoc Prof Frits RW Suling, MD Oryza Gyragus Prabu, MD Andri Gunawan, MD
Registration & Web / IT	: Estu Rudiktyo, MD Ricky Gusanto Kurniawan, MD David Pangeran, MD
Venue & Accomodation	: Rarsari Soerarso Pratikto, MD
Dinner/Industrial Meeting	: Ekawati Dani Yulianti, MD Anandhara Indriani, MD

Acknowledgement

The 20th Scientific Meeting on Hypertension of Indonesian Society of Hypertension Organizing Committee expresses sincere gratitude to the following companies for their support of the meeting:



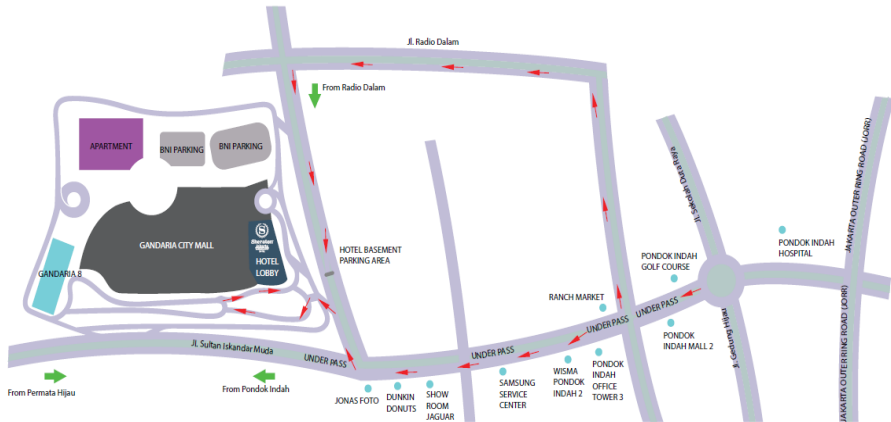
Acknowledgement

Sponsors :

PT. Astra Zeneca
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PT. Darya Varia Laboratoria tbk
PT. Ferron Pharmaceuticals
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PT. Otto Pharmaceutical Industries
PT. Merck Indonesia
PT. Abbott Indonesia
PT. Transfarma Medica Indah
PT. Fahrenheit Indonesia
PT. Prodia Indonesia
PT. Gemilang Usaha Inti
PT. Beurer Indonesia

General Information

- Name of event** : 20th Scientific Meeting of the Indonesian Society of Hypertension
- Date** : February 13th – 15th, 2026
- Venue** : Sheraton Grand Jakarta Gandaria City Hotel
 Jl. Sultan Iskandar Muda, Kebayoran
 Jakarta, 12240, Indonesia
 Phone: +62 21 806 30888



General Information

IMPORTANT DATES & VENUE

20th InaSH Workshop	February 13 th , 2026	
20th Scientific Meeting of InaSH	February 13 th – 15 th , 2026	
InaSH Business Meeting	February 13 th , 2026 Meeting Room 2	19.00 hrs
Opening Ceremony	February 13 th , 2026 Ballroom 2	09.30 hrs
InaSH Concensus Launching	February 15 th , 2026 Ballroom 2	14.30 hrs
Young Investigator Award	February 14 th , 2026 Ballroom 1	10.30 hrs
Trigger Quiz Competition	February 14 th , 2026 Ballroom 1	11.30 hrs

Note: All venues are in 3rd Floor

Workshop of InaSH (WS):

Connecting the Heart, Brain, and Kidney: Case-Based Management of Hypertensive Complications

February 13th, 2026 Sapphire Ballroom, 3rd Floor 08.00 hrs

Workshop of Hypertension by OMRON ACADEMY

February 13th, 2026 Emerald Ballroom, 3rd Floor 08.00 hrs

General Information

DAILY VENUE

Registration	Main Lobby Hotel, G Floor
Plenary Session	Ballroom 2, 3rd Floor
Symposium	Ballroom 2, Ballroom 3 (3rd Floor)
Slide Counter	Meeting Room 2, 3rd Floor
Moderated Poster Section	Ballroom 1 Foyer, 3rd Floor
Poster Section	Ballroom Foyer, 3rd Floor
Secretariat	Meeting Room 1, 3rd Floor
Faculty Lounge	Meeting Room 2, 3rd Floor
Musholla	3rd Floor

Language

The official language of meeting is Bahasa Indonesia or English. Translation is not provided.

Congress Badge

Congress badge should be worn during all congress. No Badge, No Entry.

Certificate

Certificate with Ministry of Health Accreditation can be downloaded through SATU SEHAT application. This certificate can only be downloaded individually when the participant complete the whole congress attendance and submit the quiz.

CHAIRPERSON GUIDELINES

- Kindly be in the room at least 10 minutes before the session begins
- Respect the timing allowed to the session and to each presentation
- Language for all presentations, discussions and questions as follows:
20th InaSH Meeting & Workshop: Bahasa Indonesia or English
- The use of English language during the whole symposium is mandatory only in the presence of one or more invited overseas speakers

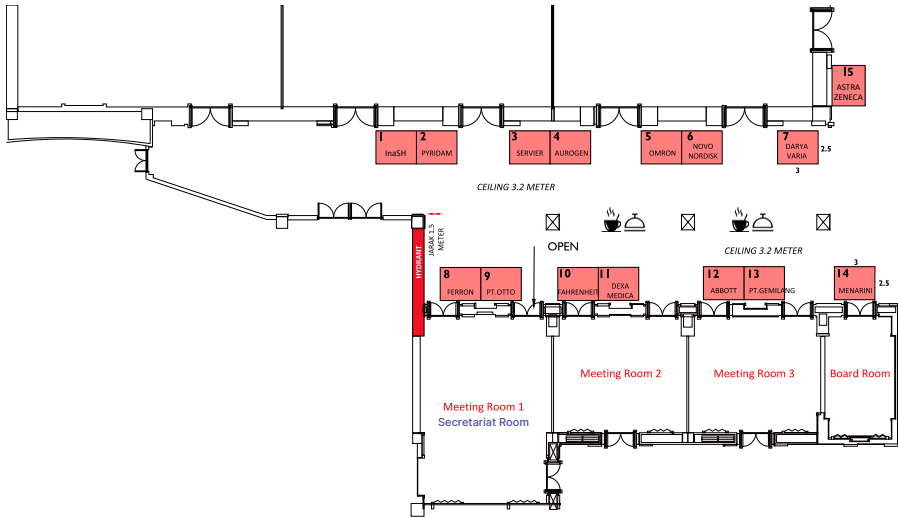
General Information

SPEAKER GUIDELINES

- All presentation slides should be submitted in the **Slide Counter (Faculty Lounge, Meeting Room 2)** at least **3 hours before** the presentation
- Speakers can check their slides in the Slide Counter by asking assistance from the audio visual operators
- **Personal computers cannot be connected** directly on the computer of in the room of each session
- All presentation slides **should be presented in the 20th Scientific Meeting of InaSH basic slide template.**
- We kindly request speakers to provide the slides in a Windows compatible format
- Kindly be in the room at least **10 minutes** before the session begins and respect the timing allowed for your presentation
- Language for all presentations, discussions and questions as follows:
20th InaSH Meeting & Workshop : Bahasa Indonesia or English
- The use of English language during the whole symposium is mandatory only in the presence of one or more invited overseas speakers

General Information

LIST OF EXHIBITORS



COMPANY	BOOTH
InaSH	1
Pyridam Farma	2
Servier Indonesia	3
Aurogen Pharma Indonesia	4
Omron Healthcare Indonesia	5
Novonordisk Indonesia	6
Darya Varia Laboratoria	7
Ferron Pharmaceuticals Indonesia	8
Otto Indonesia	9
Fahrenheit Indonesia	10
Dexa Medica	11
Abbott Indonesia	12
Gemilang Usaha Inti	13
Transfarma Medica Indah	14
Astra Zeneca	15

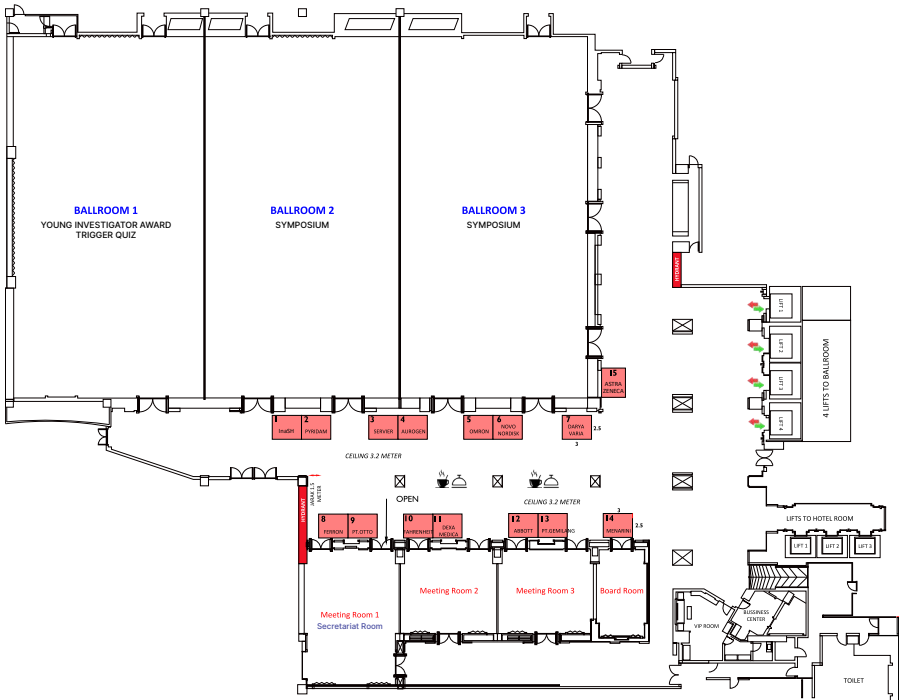
General Information

EXHIBITION MAP



**20th SCIENTIFIC MEETING OF
 THE INDONESIAN SOCIETY OF HYPERTENSION**
**Empowering Communities, Personalizing Care of
 Hypertension and Cardio-Cerebro-Renal Complications**

Sheraton Grand Gandaria City Hotel Jakarta, Indonesia
 February 13th - 15th, 2026



Program at Glance

**20th SCIENTIFIC MEETING OF
THE INDONESIAN SOCIETY OF HYPERTENSION**
Empowering Communities, Personalizing Care of
Hypertension and Cardio-Cerebro-Renal Complications

Workshop

February 13th, 2026

Scientific Session

Saturday, February 14th, 2026

Sunday, February 15th, 2026

Workshop

February 13th, 2026

08.00 - 15.00

Workshop 1

Connecting the Heart, Brain, and
Kidney: Case-Based Management of
Hypertensive Complications

Interactive Case Discussion

08.00 - 15.15

Workshop 2

Workshop of Hypertension by
OMRON ACADEMY

Interactive Case Discussion

19.00

Business Meeting - InaSH

Program at Glance

Scientific Program

Saturday, February 14th, 2026

	BALLROOM 1	BALLROOM 2	BALLROOM 3	
08.00 - 08.40	MORNING TALKS ON HYPERTENSION Hypertension Among The Community: Nowadays			
08.40 - 09.30		PLENARY SESSION 1		
09.30 - 10.00		OPENING CEREMONY		
10.00 - 10.30	COFFEE BREAK			
10.30 - 11.30	(10.30 - 12.00) YOUNG INVESTIGATOR AWARD	SYMPOSIUM 1 Protecting the Cardio-Kidney-Metabolic Universe: Guardianship of the Galaxy	SYMPOSIUM 2 The New Era of HMOD Prevention	MODERATED POSTER (Foyer of Ballroom 1)
11.30 - 12.30	(12.00 - 12.30) TRIGGER QUIZ Preliminary Round	Lunch Symposium 1 Silent Risks, Loud Warnings: Navigating the Dual Burden of Hypertension and Diabetes	Lunch Symposium 2 Medical Treatment of Hypertension Related Cardio Renal Syndrome	
12.30 - 13.30	LUNCH			
13.30 - 14.30		Symposium 3 Future Cardiovascular Care: Metabolism, Screening and Therapy	Symposium 4 Closing the Gap Between Guidelines and Real World Blood Pressure Control	
14.30 - 15.30		Symposium 5 JOINT SYMPOSIUM Hypertension and Beyond: Cardio-Renal-Endocrine Convergence in Asia-Pacific	Symposium 6 ASCVD and Secondary Hypertension: When to Aware, How to Manage	

REGISTRATION

Program at Glance

Scientific Program

Sunday, February 15th, 2026

	BALLROOM 1	BALLROOM 2	BALLROOM 3
08.00 - 08.30	DEBATE SESSION How Low Can You Go for Lowering Hypertension in Elderly		
08.30 - 09.30		PLENARY SESSION 2	
09.30 - 10.00		InaSH AWARD	
10.00 - 10.30	COFFEE BREAK		
10.30 - 11.30	TRIGGER QUIZ Final Round	SYMPOSIUM 7 JOINT SYMPOSIUM APSH and InaSH Idosterone in Hypertension	SYMPOSIUM 8 Advancing Cardiometabolic Health: What Should Be the Proper Drug?
11.30 - 12.30		Lunch Symposium 3 Metabolic Rescue in Acute Stroke	Lunch Symposium 4 Hypertension Management Challenges among Varied Communities
12.30 - 13.30	LUNCH		
13.30 - 14.30		Symposium 9 Overly-Treated Hypertension: Is It Risk-Free?	Symposium 10 Detecting the Invisible: Identifying Subclinical Organ Damage of Hypertension in Community
14.30 - 15.00		LAUNCHING InaSH PRACTICAL GUIDE BOOK	
15.00 - 15.15		CLOSING CEREMONY	

Faculty Members

OVERSEAS FACULTY MEMBERS



Prof Ji-Guang WANG, MD, PhD

Deputy President, HOPE Asia Network

President, Chinese Hypertension League



Prof Teo Boon Wee, MD, PhD

Secretary General, Asia Pacific Society of Hypertension

Secretary, Singapore Society of Hypertension



Prof Narsingh Verma, MD, PhD

Secretary General, Indian Society of Hypertension

Past President, Asian-Pacific Society of Hypertension

Head of Department, King George's Medical University Lucknow



Prof Anuj Maheshwari, MD, PhD

Treasurer, Indian Society of Hypertension

Vice President, Research Society for the Study of Diabetes in India (RSSDI)

Head of Medicine, Babu Banarasi Das University

Scientific Program

WORKSHOP 1

Friday, February 13th, 2026

Saphire Ballroom, Sheraton Grand Gandaria City, Jakarta

Connecting the Heart, Brain, and Kidney: Case-Based Management of Hypertensive Complications

Chair: Oryza Gryagus Prabu, MD

TIME	TOPIC	SPEAKER
08.00 - 08.30	Registration	
08.30 - 09.00	Pre Test	
09.00 - 09.30	Hypertensive Heart Disease with HFpEF: How To Optimize Therapy?	Paskariatne Probodewi, MD
09.30 - 10.00	Acute Hypertensive Stroke: Timing and Target of BP Control	Abdul Wahid, MD
10.00 - 10.15	Discussion	
10.15 - 10.45	Coffee Break	
10.45 - 11.15	Hypertensive CKD with Proteinuria: Role of RAAS Blockade and SGLT2i	Wachid Putranto, MD
11.15 - 11.30	Q&A	
11:30 - 13:00	FRIDAY PRAYING & LUNCH	
13.00 - 13.30	How to Optimize Outcome in Stroke Patients with Chronic Hypertension	David Pangeran, MD
13.30 - 14.00	Multidisciplinary Roundtable: Balancing Risks and Benefits in Hypertension Treatment Targets	Dimas Septiar, MD
14.00 - 14.30	Round Table Discussion	
14.30 - 15.00	Closing	

Scientific Program

WORKSHOP 2

Friday, February 13th, 2026

Emerald Ballroom, Sheraton Grand Gandaria City, Jakarta

Workshop of Hypertension by OMRON ACADEMY

Chair: Rarsari Soerarso, MD

TIME	TOPIC	SPEAKER
08.00 - 08.30	Registration	
08.30 - 09.00	Pre Test	
09.00 - 09.30	How To Do The Right Diagnosis of Hypertension?	Rarsari Soerarso, MD
09.30 - 10.00	Tips and Trick on Screening for Complications of Hypertension	Eka Harmeiwaty, MD
10.00 - 10.30	Coffee Break	
10.30 - 11.00	Current Recommendation of Hypertension Management From Acute to Chronic Settings	Dian Yaniarti, MD
11.00 - 11.30	Hypertension Management in Special Populations Specific to the Capabilities and Resources of Low and Middle-Income Health Systems	Tities Indra, MD
11.30 - 13.00	FRIDAY PRAYING & LUNCH	
13.00 - 14.00	Hands On Session: BP Measurement and Monitoring (ABPM - HBPM)	
14.00 - 14.30	Discussion	
14.30 - 15.00	Post Test	
15.00 - 15.15	Closing	

Scientific Program

Scientific Program

Saturday, February 14th, 2026
 Sheraton Grand Gandaria City, Jakarta

07.00 - 08.00 **REGISTRATION**

MORNING TALKS

BALLROOM 2

Hypertension Among The Community: Nowadays

Chair: *Adre Mayza, MD*

08.00 - 08.10 Future Burden Beyond Hypertension
Yulia Sofiatin, MD, PhD

08.10 - 08.20 The Impact of Hypertension Guidelines on Life Expectancy: Translating Science into Practice
Erwinanto, MD

08.20 - 08.30 Discussion

PLENARY SESSION 1

BALLROOM 2

How to Manage Hypertension in East Asian View Vs South East Asian View

Chair: *Erwinanto, MD*

08.30 - 09.00 Asia's Hypertension Landscape: From Cultural Factors to Clinical Solutions
Prof Yuda Turana, MD, PhD

09.00 - 09.30 Integrating Studies from Asian population to International Hypertension Guideline for Community-Based Hypertension Management?
Prof Narsingh Verma, MD, PhD
(Indian Society of Hypertension)

09.30 - 10.00 **OPENING CEREMONY**

BALLROOM 2

10.00 - 10.30 **COFFEE BREAK**

10.30 - 11.30 **YOUNG INVESTIGATOR AWARD**

BALLROOM 1

10.30 - 12.30 **MODERATED POSTER PRESENTATION**

Foyer of
 BALLROOM 1

Scientific Program

SYMPOSIUM 1

BALLROOM 2

Protecting the Cardio-Kidney-Metabolic Universe: Guardianship of the Galaxy

- Chair:* Assoc Prof Frits R. W. Suling, MD
- 10.30 - 10.45 Single Pill Combination Effects in Stroke Secondary Prevention
Prof Syahrul Gazali, MD, PhD
- 10.45 - 11.00 CKM Series: Breaking the Vicious Cycle of CKD, T2D, and HF
Afiatin, MD, PhD
- 11.00 - 11.15 Cardiovascular Series: The Double Strike Against Hypertension
Bagus Andi Pramono, MD
- 11.15 - 11.30 Discussion

SYMPOSIUM 2

BALLROOM 3

The New Era of HMOD Prevention

- Chair:* Prof Yuda Turana, MD, PhD
- 10.30 - 10.45 Cracking the Code of HMOD
Eka Musridharta, MD
- 10.45 - 11.00 Managing the Double Trouble: Hypertension and Atrial Fibrillation in Clinical Practice
Prof Yoga Yuniadi, MD, PhD
- 11.00 - 11.15 Adaptive Hypertension Management: Flexible Use of Single-Pill Combinations Across the Patient Pathway
Nyoman Paramita Ayu, MD
- 11.15 - 11.30 Discussion
- 11.30 - 12.30 **Trigger Quiz – Preliminary Round** BALLROOM 1

Scientific Program

LUNCH SYMPOSIUM 1

BALLROOM 2

Silent Risks, Loud Warnings: Navigating the Dual Burden of Hypertension and Diabetes

Chair: *Eka Harmeiwaty, MD*

11.30 - 11.50 Three Mechanisms, One Solution: Unlocking Better Blood Pressure Control

Siska Suridanda Dany, MD

11.50 - 12.10 Timeless or Time's Up? Rethinking Sulfonylureas in the Modern Diabetes Algorithm

Roy Panusunan Sibarani, MD

12.10 - 12.30 Discussion

LUNCH SYMPOSIUM 2

BALLROOM 3

Medical Treatment of Hypertension Related Cardio Renal Syndrome

Chair: *Amanda Tiksnadi, MD, PhD*

11.30 - 11.45 Beyond Glucose: Unlocking Kidney and Heart Protection in Diabetes and Heart Failure

Ria Bandiara, MD

11.45 - 12.00 Controlling the Beat to Save the Heart: Beta-Blockade in Hypertension and Heart Failure

Rossana Barack, MD

12.00 - 12.15 Managing Hyperkalemia: Enabling Comprehensive RAASi Use in Hypertensive Patients

Pranawa Martosuwignyo, MD

12.10 - 12.30 Discussion

12.30 - 13.30 LUNCH

Scientific Program

SYMPOSIUM 3

BALLROOM 2

Future Cardiovascular Care: Metabolism, Screening and Therapy

- Chair: Prof Syahrul Gazali, MD, PhD*
- 13.30 - 13.45 From Hemodynamics to Metabolism: New Pathways in Hypertension and CVD
Prof Bambang Purwanto, MD, PhD
- 13.45 - 14.00 From Heart Rate to Vascular Tone: Integrated Control in Hypertension
Prof Antonia Anna Lukito, MD, PhD
- 14.00 - 14.15 The Kynurenine/Tryptophan Ratio: A Hidden Pathway in Cardiovascular Risk
Estu Rudiktyo, MD, PhD
- 14.15 - 14.30 Discussion

SYMPOSIUM 4

BALLROOM 3

Closing the Gap Between Guidelines and Real World Blood Pressure Control

- Chair: Siska Suridanda Dany, MD*
- 13.30 - 13.45 Cardio-Kidney-Metabolic Prevention in elevated BP: What Guidelines Now Recommended
Bambang Widyantoro, MD, PhD
- 13.45 - 14.00 Rethinking Hypertension: Why ARBs Are Changing the Game
Prof Rakhmad Hidayat, MD, PhD
- 14.00 - 14.15 Blood Pressure Control Triad: The Hidden Power of a Calcium Blocker
Tunggul D. Situmorang, MD
- 14.15 - 14.30 Discussion

Scientific Program

SYMPOSIUM 5 JOINT SYMPOSIUM

BALLROOM 2

Hypertension and Beyond: Cardio-Renal-Endocrine Convergence in Asia-Pacific

- Chair: *Arieska Ann Soenarta, MD*
- 14.30 - 14.45 Albuminuria First: Reframing Risk Stratification and Treatment Strategy in Asia-Pacific Region
Prof Teo Boon Wee, MD, PhD
(The Asian-Pacific Society of Hypertension)
- 14.45 - 15.00 The Metabolic Triple Alliance to Reduce Blood Pressure and Protect Organs: Focus in Asia-pacific Region
Prof Anuj Maheshwari, MD, PhD
(Indian Society of Hypertension)
- 15.00 - 15.15 Genomics and Epigenetics Perspective of Hypertension in Asia: Precision Medicine is on the Horizon?
Anwar Santoso, MD, PhD
- 15.15 - 15.30 Discussion

SYMPOSIUM 6

BALLROOM 3

ASCVD and Secondary Hypertension: When to Aware, How to Manage

- Chair: *Aryatama Nurhasyim, MD*
- 14.30 - 14.45 Clinical Spectrum of Chronic Coronary Syndrome: When to Suspect and Initiate Treatment
Badai Bhatara Tiksnadi, MD
- 14.45 - 15.00 Renovascular Hypertension: Mechanism and How to Manage
Artaria Tjempakasari, MD
- 15.00 - 15.15 Avoiding Ischemic Reperfusion VS Hypoperfusion Injury in Managing Stroke due to Large Artery Atherosclerosis
Dinda Diafiri, MD
- 15.15 - 15.30 Discussion
- 15.30 - 15.45 **CLOSING**

BALLROOM 2

Scientific Program

Scientific Program

Sunday, February 15th, 2026

Sheraton Grand Gandaria City, Jakarta

DEBATE SESSION

BALLROOM 2

How Low Can You Go for Lowering Hypertension in Elderly

Chair: *Freddy Sitorus, MD*

08.00 - 08.05 Case Presentation

Anandhara Indriani, MD

08.05 - 08.30 Debate

Panelists: *Lisda Amalia, MD, PhD*

Zulkhair Ali, MD, PhD

Prof Saifur Rohman, MD, PhD

PLENARY SESSION 2

BALLROOM 2

Chair: *Prof Teguh Ranakusuma, MD, PhD*

08.30 - 09.00 Transforming Hypertension Diagnosis and Management
in the Era of Artificial Intelligence

Daniel Tjen, MD

09.00 - 09.30 Hypertension 360°: From Grading to Organ Protection
via Mechanism-Based Therapy

Prof Jiguang Wang, MD, PhD

(HOPE Asia Network)

09.30 - 10.00 **InaSH AWARD**

BALLROOM 2

10.00 - 10.30 **COFFEE BREAK**

10.30 - 11.30 **Trigger Quiz - Final Round**

BALLROOM 1

Scientific Program

SYMPOSIUM 7

BALLROOM 2

JOINT SYMPOSIUM APSH (The Asian-Pacific Society of Hypertension) and InaSH

Aldosterone in Hypertension

Chair: *Afiatin, MD, PhD*

10.30 - 10.45 Screening for Hyperaldosteronism in kidney disease: A difficult problem

*Prof Teo Boon Wee, MD
(APSH)*

10.45 - 11.00 Volume Salt Sensitivity in Aldosterone: Why Asia is Different?

Ni Made Hustrini, MD

11.00 - 11.15 Primary Aldosterone Screen in Patients with Hypertension

*Prof Jiguang Wang, MD, PhD
(APSH)*

11.15 - 11.30 Discussion

SYMPOSIUM 8

BALLROOM 3

Advancing Cardiometabolic Health: What Should Be the Proper Drug?

Chair: *Celly Anantaria, MD*

10.30 - 10.45 Cerebral Small Vesel Disease in Hypertensive Patient with Obesity

Ekawati Dani Yulianti, MD

10.45 - 11.00 From Burden to Breakthrough: Bridging the Gap of Obesity and Cardiometabolic Health

Tri Juli Tarigan, MD

11.00 - 11.15 Semaglutide in the Hands of Clinicians: Evidence, Experience, and Expertise

I Made Putra Swi Antara, MD

11.15 - 11.30 Discussion

LUNCH SYMPOSIUM 3

BALLROOM 2

Metabolic Rescue in Acute Stroke

Chair: *Zulkhair Ali, MD, PhD*

11.30 - 11.50 The Role of Labetalol on Hypertensive Crisis in Stroke

Mursyid Bustami, MD, PhD

11.50 - 12.10 Update Neuroprotectant on Cascade Ischemic Injury

Prof Al Rasyid, MD, PhD

12.10 - 12.30 Discussion

Scientific Program

LUNCH SYMPOSIUM 4

BALLROOM 3

Hypertension Management Challenges among Varied Communities

Chair: *Djoko Wibisono, MD*

11.30 - 11.45 How to Optimize Blood Pressure Monitoring: How to Measure?

Farizal Rizky, MD

11.45 - 12.00 Pediatric Hypertension: The Importance of Prevention and Early Diagnosis

Olfy Lelya, MD

12.00 - 12.15 Hypertension Profile Indonesian Patient in Threatening Kidney Disease

Maruhum Bonar Marbun, MD, PhD

12.15 - 12.30 Discussion

12.30 - 13.30 **LUNCH**

SYMPOSIUM 9

BALLROOM 2

Overly-Treated Hypertension: Is It Risk-Free?

Chair: *Ni Made Hustrini, MD*

13.30 - 13.45 Potential Adverse Outcome of Blood Pressure Lowering: Is It Possible, Harmful, and Managable?

Celly Anantaria, MD

13.45 - 14.00 Orthostatic Hypotension in Hypertension: Risk and Treatment Strategies

Cep Juli, MD

14.00 - 14.15 Is It Better to Over-Treated or Under-Treated Hypertension in Chronic Kidney Disease?

Pringgodigdo Nugroho, MD

14.15 - 14.30 Discussion

Scientific Program

SYMPOSIUM 10

BALLROOM 3

Detecting the Invisible: Identifying Subclinical Organ Damage of Hypertension in Community

Chair: *Prof Suhardjono, MD, PhD*

13.30 - 13.45 Mild cognitive impairment in hypertension: More devastating than it seems

Amanda Tiksnadi, MD, PhD

13.45 - 14.00 Bidirectional Detrimental Association of Hypertension and Atrial fibrillation, and How to Treat

BRM Ario Soeryo Kuncoro, MD

14.00 - 14.15 Spectrum of Subtle Signs Towards Renovascular Complications of Hypertension in Community

Djoko Wibisono, MD

14.15 - 14.30 Discussion

14.30 - 15.00 **LAUNCHING InaSH PRACTICAL GUIDE BOOK**

15.00 - 15.30 **CLOSING CEREMONY**

Abstract Speaker

MORNING TALK

The Impact of Hypertension Guidelines on Life Expectancy: Translating Science into Practice

Erwinanto MD

Department of Cardiology and Vascular Medicine

Faculty of Medicine Universitas Padjadjaran

Bandung

Guidelines are intended to translate scientific evidence into clinical practice by providing recommendation on initiation and intensification of treatment. Adopting hypertension guideline in clinical practice will increase the number of people labelled as having hypertension and treated with drugs. Latest hypertension guidelines are based on trials that provide evidence of survival benefit of intensive BP lowering to 120-129/70-79 mm Hg. However, traditional reporting of mortality reduction is not readily translated into long-term survival benefit because clinical trials are designed to assess therapeutic efficacy over a finite time frame. RCTs can last no more than a small fraction of the life expectancy of most hypertensive patients, which means that the current recommendation of life-long hypertension treatment is necessarily based on extrapolation from much shorter time data.

Communicating prognosis and potential survival benefit of a therapy or strategy has proved challenging in clinical practice. Survival benefit of blood pressure-lowering treatment is not readily interpretable outside medical communities. Provision of time frames of potential future adverse events may facilitate shared decision-making and patient and caregiver planning.

Survival benefits associated with intensive hypertension treatment quickly attenuated after intervention is discontinued and, thus, strategy to maintain survival benefit in clinical practice is required. Strategy to gain survival benefit in clinical practice includes (1) lowering blood pressure to 120-129/70-79 mm Hg as recommended by most

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hypertension guidelines, (2) improving medication adherence, and (2) improving clinical inertia (the failure to intensify treatment when needed).

PLENARY SESSION 1

Asia Hypertension Landscape : From Cultural Determinants to Clinical Solutions

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Abstract

Hypertension in Asia poses a major public health challenge, shaped by distinct biological, cultural, and environmental factors. Compared with Western populations, Asians exhibit greater salt sensitivity, higher blood pressure variability (BPV), prominent morning blood pressure surge, and a higher prevalence of nocturnal hypertension, contributing to an increased risk of stroke and vascular dementia. Rapid urbanization, high salt intake, rising obesity, air pollution, seasonal variation, and low awareness further worsen blood pressure control. White-coat and masked hypertension are more common in Asian populations, particularly among older adults, leading to misclassification and suboptimal treatment. Regional cohort studies demonstrate a dose-response relationship between BPV and cardiovascular outcomes, with stroke risk exceeding that of coronary heart disease. Home and ambulatory blood pressure monitoring are therefore essential for accurate diagnosis and management. Effective hypertension control in Asia requires culturally informed, individualized strategies that bridge upstream determinants with context-specific clinical and system-level solutions.

Abstract Speaker

SYMPOSIUM 1

CKM Series: Breaking the Vicious Cycle of CKD, T2D, and HF

Afiatin MD.PhD

Cardiovascular-kidney-metabolic health reflects the interplay among metabolic risk factors, chronic kidney disease, and the cardiovascular system and has profound impacts on morbidity and mortality. There are multisystem consequences of poor cardiovascular-kidney-metabolic health, with the most significant clinical impact being the high associated incidence of cardiovascular disease events and cardiovascular mortality. There is a high prevalence of poor cardiovascular-kidney-metabolic health in the population, with a disproportionate burden seen among those with adverse social determinants of health.

However, there is also a growing number of therapeutic options that favourably affect metabolic risk factors, kidney function, or both that also have cardioprotective effects. To improve cardiovascular-kidney-metabolic health and related outcomes in the population, there is a critical need for (1) more clarity on the definition of cardiovascular-kidney-metabolic syndrome; (2) an approach to cardiovascular-kidney-metabolic staging that promotes prevention across the life course; (3) prediction algorithms that include the exposures and outcomes most relevant to cardiovascular-kidney-metabolic health; and (4) strategies for the prevention and management of cardiovascular disease in relation to cardiovascular-kidney-metabolic health that reflect harmonization across major subspecialty guidelines and emerging scientific evidence.

Chronic Kidney Disease (CKD) as a major consequence of Type 2 DM and also as a risk factor as well as a consequence of cardiovascular disease. Early detection of CKD play an important role in prevention of CKD progression. CKD is diagnosed based on estimated Glomerular Filtration Rate (formula based on creatinine) and albuminuria level. Reduced GFR and albuminuria are risk factor for CV death. Holistic

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approach of CKD is needed for improving outcome in this population. One of the first line drug therapy is SGLT2 Inhibitor not only in Type 2 DM but to all of CKD with proteinuria and or heart failure.

SYMPOSIUM 1

Cardiovascular Series: The Double Strike Against Hypertension

Bagus Andi Pramono

RSUD Panembahan Senopati Bantul

Background: Hypertension remains a major contributor to cardiovascular morbidity and mortality. Despite improved blood pressure (BP) control, the incidence of heart failure, stroke, and chronic kidney disease continues to rise. This paradox suggests that hypertension is not merely a disorder of elevated BP, but a systemic cardiovascular disease involving mechanisms beyond numerical BP values.

Discussion: The Double Strike concept describes two parallel and synergistic pathways of cardiovascular injury in hypertension. The first strike is hemodynamic overload, in which sustained elevation of afterload leads to maladaptive left ventricular remodeling, myocardial fibrosis, and progressive diastolic and systolic dysfunction. The second strike is neurohormonal and vascular injury, driven by chronic activation of the renin–angiotensin–aldosterone system and sympathetic nervous system, resulting in endothelial dysfunction, vascular remodeling, increased systemic vascular resistance, and accelerated target-organ damage. These mechanisms reinforce each other, forming a vicious cycle that perpetuates cardiovascular injury even when BP appears controlled, thereby explaining persistent residual cardiovascular risk in treated hypertensive patients.

Conclusion: Hypertension should be understood as a dual-pathway cardiovascular disorder rather than a simple hemodynamic

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abnormality. Effective management requires strategies that address both hemodynamic load and neurohormonal–vascular injury to reduce residual risk and prevent progression to heart failure and other target-organ complications.

Keywords: Hypertension; vascular remodeling; neurohormonal activation; left ventricular hypertrophy; cardiovascular risk.

SYMPOSIUM 1

Single Pill Combination Effects in Stroke Secondary Prevention

Prof Syahrul Gazali, MD, PhD

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Prevention is one of the four cardinal pillars of the stroke quadrangle, including surveillance, prevention, acute care, and rehabilitation, across diverse populations. Landmark prospective studies have highlighted the major modifiable risk factors for stroke, namely hypertension, dyslipidemia, current smoking, increased waist-to-hip ratio, unhealthy diets, physical inactivity, diabetes, alcohol consumption, psychosocial stress and depression, and cardiac disease. Single Pill Combinations (SPCs), often referred to as polypills when they had three or more components, are increasingly recognized as a cornerstone of secondary stroke prevention because they improve treatment adherence and reduce major vascular events. In secondary stroke prevention, SPCs (combining two or more agents) significantly enhance medication adherence and persistence by reducing pill burden, overcoming clinical inertia, and enabling more rapid blood pressure control.

SPCs consisting of statin, a blood pressure reducing agent, and, optionally, aspirin have demonstrated substantial benefits in reducing

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the risk of stroke recurrence. Several studies project meaningful reductions in stroke events, for example polypills containing aspirin, ramipril, and atorvastatin shown to significantly lower the risk of major adverse cardiovascular events in patients with history of cardiovascular disease. These findings support the use of SPCs, particularly in patients with multiple comorbidities and a high pill burden, as long-term benefits including significant reductions in mortality and cardiovascular events. Effective secondary prevention combinations typically include antihypertensive agents, most commonly a renin-angiotensin system blocker (ACE inhibitor or ARB) combined with a calcium-channel-blocker or a thiazide diuretic, along with lipid-lowering therapy using statin and antiplatelet therapy with low-dose aspirin and optional folic acid supplementation. Current recommendations for secondary stroke prevention advised targeting a blood pressure below 130/80 mmHg.

Evidence from single polypill trials has shown the safety and efficacy of a combinations usually consisting of statin, antihypertensive drugs, and antiplatelet therapy such as aspirin, in reducing the risk of stroke and other vascular events. At the population level, approaches to primordial prevention; including dietary strategies such as folic acid supplementation in folate-deficient populations, increased consumption of green leafy vegetable consumption, and broader implementation of the polypill strategy; are particularly attractive and offer practical advantages, especially in low-resource settings.

Key Words: secondary prevention, single pill combination, stroke.

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SYMPOSIUM 2

Cracking the Code of Hypertension-Mediated Organ Damage (HMOD)

Musridharta E.

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Hypertension-mediated organ damage (HMOD) represents a pivotal intersection between chronic blood pressure elevation and the onset of irreversible structural and functional changes across multiple organ systems. The pathophysiology of HMOD is multifaceted, involving hemodynamic overload, neurohormonal dysregulation, oxidative stress, and chronic low-grade inflammation, which collectively drive maladaptive remodeling in the heart, vasculature, kidneys, brain, and retina. Sustained hypertension induces left ventricular hypertrophy (LVH) and diastolic dysfunction through increased afterload and myocardial wall stress, with interstitial fibrosis and apoptosis further compromising cardiac compliance and predisposing to heart failure, arrhythmias, and sudden cardiac death. Vascular manifestations encompass endothelial dysfunction, arterial stiffness, and accelerated atherosclerosis, notably in the carotid arteries, which heighten the risk of stroke and myocardial infarction. Renal involvement is characterized by hypertensive nephropathy, manifesting as microalbuminuria and progressive decline in glomerular filtration rate, ultimately leading to chronic kidney disease and amplifying cardiovascular risk. Ocular sequelae, including hypertensive retinopathy, reflect microvascular injury and serve as accessible markers of systemic vascular compromise. The clinical implications of HMOD are profound: its presence independently escalates the risk of major adverse cardiovascular events (MACEs), irrespective of blood pressure control, and portends a worse prognosis in both asymptomatic and symptomatic individuals. Early detection remains challenging due to the often subclinical nature of organ damage and the limitations of conventional diagnostic modalities. While echocardiography and advanced imaging enhance the sensitivity for cardiac and vascular remodeling, and urine albumin-

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to-creatinine ratio facilitates renal assessment, the integration of novel plasma biomarkers—such as natriuretic peptides, microRNAs, and markers of oxidative stress—offers promise for earlier and more precise identification of HMOD. However, the heterogeneity in biomarker specificity and the need for multi-marker strategies underscore ongoing diagnostic complexity. Therapeutic strategies have evolved in parallel with mechanistic insights: renin–angiotensin–aldosterone system (RAAS) inhibitors remain foundational, demonstrating efficacy in regressing LVH, reducing albuminuria, and mitigating vascular remodeling. Recent guideline updates from the European Society of Cardiology (ESC), European Society of Hypertension (ESH), and American College of Cardiology/American Heart Association (ACC/AHA) advocate for more intensive blood pressure targets and emphasize the early initiation of combination antihypertensive therapy, often favoring single-pill regimens to enhance adherence. Sodium-glucose cotransporter 2 inhibitors (SGLT2i) and glucagon-like peptide-1 receptor agonists (GLP-1RA), initially developed for metabolic indications, have shown organ-protective effects by attenuating oxidative stress, restoring mitochondrial function, and modulating inflammatory pathways, thereby offering additional benefit in HMOD beyond glycemic control. Device-based interventions, such as renal denervation, are emerging as adjuncts for resistant hypertension, with evidence supporting their role in reducing sympathetic overactivity and regressing organ damage. The complexity of HMOD necessitates a multidisciplinary management paradigm, integrating cardiology, nephrology, neurology, and ophthalmology, to tailor interventions based on the extent and distribution of organ involvement. Guideline-directed care pathways now incorporate routine screening for HMOD in all hypertensive patients, leveraging both in-office and out-of-office blood pressure monitoring, comprehensive risk stratification, and individualized therapeutic intensification. Despite these advances, significant gaps persist in the early recognition and optimal management of HMOD, particularly in resource-limited settings and among high-risk populations. The global burden of HMOD continues to rise, driven by aging demographics, increasing prevalence of hypertension, and persistent disparities in healthcare access. Research frontiers are focused on refining biomarker panels, elucidating the molecular underpinnings of organ-specific

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damage, and developing targeted therapies that disrupt the pathogenic nexus of inflammation, oxidative stress, and neurohormonal activation. In summary, cracking the code of HMOD hinges on the integration of mechanistic understanding, early and accurate detection, and the deployment of multifaceted, guideline-informed therapeutic strategies within a multidisciplinary framework. Early intervention and vigilant monitoring are paramount to arrest the progression of organ damage, reduce cardiovascular morbidity and mortality, and ultimately improve outcomes for the growing population affected by hypertension.

Key Words: HMOD, Hypertension, Organ Damage.

SYMPOSIUM 2

Adaptive Hypertension Management: Flexible Use of Single-Pill Combinations Across the Patient Pathway

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Abstrak

Hipertensi merupakan faktor risiko yang signifikan terhadap penyakit kardiovaskular dan serebrovaskular serta penyebab utama kematian dini di seluruh dunia. Prevalensi hipertensi di Indonesia masih sangat tinggi, dengan sekitar sepertiga orang dewasa terdampak dan proporsi yang terkontrol tetap rendah sehingga beban kardiovaskular dan ginjal jangka panjang tetap besar. Keberhasilan kontrol tekanan darah sangat dipengaruhi oleh adheren minum obat pasien, pemakaian beberapa jenis obat yang dikombinasikan seringkali membuat pasien merasa kesulitan dan menimbulkan penurunan adheren. Penggunaan *single-pill combination* (SPC) sepanjang perjalanan klinis pasien hipertensi berpotensi menjadi strategi kunci untuk meningkatkan kontrol tekanan

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darah. Pedoman global terkini (ISH 2020, WHO 2021, ESH 2023, ESC 2024) merekomendasikan terapi kombinasi, idealnya SPC, sejak awal pada sebagian besar pasien untuk mempercepat pencapaian target dan meningkatkan adheren. Namun, di Indonesia, penerapan SPC masih terbatas oleh variasi ketersediaan, keterjangkauan, dan belum terintegrasi secara sistematis dalam algoritme tatalaksana di berbagai level layanan, khususnya primer dan daerah dengan sumber daya terbatas.

Kesenjangan utama adalah kurangnya model manajemen hipertensi yang fleksibel memanfaatkan SPC secara dinamis (inisiasi, intensifikasi, de-eskalasi) yang selaras dengan profil risiko kardiovaskular, komorbid ginjal, serta konteks sistem layanan kesehatan dan formularium nasional. Penelitian implementasi dan kebijakan yang mengevaluasi dampak "SPC-first" terhadap kontrol tekanan darah, kunjungan lanjutan, dan kejadian kardiovaskular di setting layanan kesehatan Indonesia menjadi sangat penting. Hasilnya berimplikasi langsung pada pembaruan pedoman nasional, perencanaan pembiayaan, dan penyusunan formularium antihipertensi yang lebih mendukung penggunaan SPC yang lebih adaptif di seluruh jejaring pelayanan.

Kata kunci: Hipertensi, *Single-pill combination*, Adheren pengobatan, Program pengendalian hipertensi.

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LUNCH SYMPOSIUM 2

Beyond Glucose: Unlocking Kidney and Heart Protection in Diabetes and Heart Failure

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Abstracts

The management of type 2 diabetes mellitus (T2DM) and chronic kidney disease (CKD) has undergone to fundamental paradigm shift. Conventionally, clinical focus remained "glucose-centric," if glycemic control alone would mitigate microvascular and macrovascular complications. However, the persistent residual risk of cardiorenal events although optimal glycemia management and standard-of-care therapies, such as RAAS blockers, has necessitated a move toward direct target organ-protection strategies. The transformative role of Sodium-Glucose Cotransporter-2 inhibitors (SGLT2i), specifically Dapagliflozin, in breaking the vicious cycle of Cardiorenal Syndrome, is going to explore. The mechanism of SGLT2i extends far beyond simple HbA1c reduction. By inhibiting glucose reabsorption in the proximal tubule, these agents restore tubule-glomerular feedback (TGF), leading to afferent arteriolar vasoconstriction. This process effectively reduces intraglomerular hypertension—a primary driver of kidney disease progression—manifesting as a characteristic "initial dip" in eGFR that ultimately preserves long-term renal function. Simultaneously, SGLT2i provide systemic advantages by reducing preload and afterload through osmotic diuresis and natriuresis without triggering sympathetic nervous system overactivation. Moreover, a metabolic shift toward ketone body utilization and a reduction in oxidative stress contribute to enhanced myocardial efficiency and cellular resilience. Clinical evidence from various trials has solidified the position of Dapagliflozin

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as a cornerstone of cardiorenal-metabolic therapy. The DAPA-CKD trial depicted a significant reduction in the risk of sustained eGFR decline, end-stage kidney disease (ESKD), and cardiovascular death, notably in both diabetic and non-diabetic populations. In the cardiology field, the DAPA-HF and DELIVER trials established consistent benefits across the entire spectrum of left ventricular ejection fraction, significantly lowering heart failure hospitalizations and cardiovascular mortality. For clinicians, successful implementation requires a shift in perspective: viewing SGLT2i as organ-protective agents first and antidiabetics second. While concerns regarding the "initial dip" in eGFR often cause doubtfulness as clinician, this phenomenon should be interpreted as a marker of successful hemodynamic remodelling rather than acute injury. By adhering and considering to updated guidelines on eGFR initiation thresholds and managing volume status, practitioners can significantly slow the progression to dialysis and prevent catastrophic heart failure events. Ultimately, the integration of Dapagliflozin into clinical practice represents a dual-protective strategy: protecting the heart to save the kidney, and vice-versa.

Keywords: Cardiorenal Syndrome, Chronic Kidney Disease, Dapagliflozin, Heart Failure, Organ-protection, SGLT2 Inhibitors.

SYMPOSIUM 3

The Kynurenine/Tryptophan Ratio: A Hidden Pathway in Cardiovascular Risk

Estu Rudiktyo

Abstract

The kynurenine/tryptophan (Kyn/Trp) ratio has emerged as a novel biomarker reflecting activation of the kynurenine pathway (KP), the principal route of tryptophan metabolism. Indoleamine 2,3-dioxygenase (IDO) and tryptophan 2,3-dioxygenase (TDO) catalyze the conversion of

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tryptophan to kynurenine, a process strongly induced by inflammatory stimuli. Elevated Kyn/Trp ratios indicate enhanced KP flux and systemic immune-metabolic activation. Recent evidence highlights the role of this pathway in cardiovascular disease (CVD), particularly hypertension, where vascular inflammation, endothelial dysfunction, and oxidative stress are central mechanisms. KP metabolites exert diverse biological effects: some promote oxidative injury and vascular stiffness, while others modulate immune tolerance and fibroblast activity. Clinical studies demonstrate that hypertensive patients often exhibit increased Kyn/Trp ratios, correlating with arterial stiffness, left ventricular hypertrophy, and clustering of metabolic risk factors. Experimental models further support a causal role, showing that IDO1 deletion attenuates hypertrophic remodeling under pressure overload. These findings suggest that the Kyn/Trp ratio not only reflects inflammatory burden but may actively contribute to hypertensive pathology. As a biomarker, it offers potential for risk stratification and therapeutic targeting, though standardization and prospective validation remain essential. The Kyn/Trp ratio thus represents a hidden pathway linking immune metabolism to cardiovascular risk.

SYMPOSIUM 3

FROM HEMODYNAMICS TO METABOLISM : NEW PATHWAYS IN HYPERTENSION AND CVD

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Abstract

Hypertension is a major global health problem due to its continuously increasing prevalence. According to the World Health Organization (WHO), the number of individuals with hypertension was approximately

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650 million in 1990 and rose sharply to 1.4 billion in 2024. However, only about 23% of patients achieve adequate blood pressure control.

Hypertension is a key component of metabolic syndrome and ultimately leads to various complications, particularly cardiovascular diseases (CVD), including chronic kidney disease, coronary artery disease, heart failure, and stroke. Hypertension induces hemodynamic disturbances that result in endothelial stress, activation of nuclear factor kappa B (NF- κ B), and atherosclerosis, which subsequently contribute to the development of cardiovascular disease.

In addition, hypertension is associated with metabolic disturbances involving the renin–angiotensin–aldosterone system (RAAS), angiotensin II, aldosterone, reactive oxygen species (ROS), and diabetes mellitus (DM).

The pathogenesis of hemodynamic abnormalities leading to atherosclerosis is driven by inflammation, endothelial dysfunction, hypercoagulability, plaque formation, and vascular remodeling. Metabolic disturbances in atherosclerosis result in tissue hypoxia, increased RAAS activity, elevated angiotensin II, enhanced adrenal cortical activity, and increased aldosterone levels, which contribute to vascular remodeling and cardiomyopathy.

Angiotensin II stimulates NADPH oxidase activity, leading to increased ROS production, endothelial damage, impaired insulin secretion from pancreatic beta cells, and insulin receptor resistance, thereby indirectly contributing to the development of diabetes mellitus.

The management of hypertension includes non-pharmacological interventions such as dietary modification, particularly increased consumption of vegetables and fruits rich in antioxidants, which inhibit cholesterol absorption and slow the progression of atherosclerosis. Regular physical activity, especially aerobic exercise, enhances nitric oxide (NO) production with vasculoprotective effects, increases vascular endothelial growth factor (VEGF) promoting vasculogenesis, and stimulates endorphin release that reduces psychological stress.

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Pharmacological treatment includes angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, beta-blockers, diuretics, calcium channel blockers, mineralocorticoid receptor antagonists, and other antihypertensive agents.

A comprehensive understanding of hypertension pathogenesis allows for appropriate non-pharmacological and pharmacological management to achieve blood pressure targets and minimize cardiovascular complications.

Keywords: uncontrolled hypertension, atherosclerosis, reactive oxygen species, angiotensin II, aldosterone, nitric oxide, vascular endothelial growth factor, diabetes mellitus, cardiovascular disease.

SYMPOSIUM 5

Genomics and epigenetics perspective of hypertension in Asia: Precision medicine is on the horizon?

Anwar Santoso, MD, PhD, FIHA, FAsCC

Hypertension is a leading modifiable risk factor for cardiovascular disease (CVD) morbidity and mortality in Asia, where prevalence is rising rapidly and clinical response to standard therapies is heterogeneous. Genomic research offers an opportunity to elucidate the biological underpinnings of this heterogeneity and to enable precision prevention, diagnosis, and treatment. Large-scale genome-wide association studies (GWAS) in East, South, and Southeast Asian cohorts have identified both shared and population-specific loci related to blood pressure regulation, including variants in genes affecting sodium handling, vascular tone, and renal and metabolic pathways.

These findings underscore ethnic differences in genetic architecture and gene-environment interactions, particularly with respect to salt sensitivity, obesity, and lifestyle factors prevalent in Asian settings.

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Integration of polygenic risk scores with clinical and environmental data has demonstrated improved risk stratification for incident hypertension and CVD outcomes, although transferability across diverse Asian subgroups remains a challenge.

Emerging pharmacogenomic evidence suggests that genetic variation, including in drug-metabolizing enzymes and receptors, may guide individualized antihypertensive therapy and reduce adverse effects. Despite these advances, substantial gaps persist, including underrepresentation of certain Asian populations, limited incorporation of multi-omics and longitudinal data, and ethical, legal, and social concerns related to data sharing and equity. Addressing these gaps through collaborative, regionally representative research will be crucial to translate genomic discoveries into precision medicine strategies for hypertension in Asia.

SYMPOSIUM 6

Renovascular Hypertension : Mechanism and How to Manage

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ABSTRACT

Hypertension is the most prevalent modifiable cardiovascular disease risk factor and is the leading cause of death and disability worldwide. Hypertension is most often idiopathic, but 1–5% of patients with hypertension have renovascular disease. Renovascular hypertension is one of the most common forms of secondary hypertension. Over 95% of cases of renovascular hypertension are due either to atherosclerosis of the main renal artery trunks or to fibromuscular dysplasia. The underlying

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mechanism in renovascular hypertension is reduction of renal blood flow and hypoperfusion of the juxtaglomerular apparatus, and stimulates the release of renin followed by increased production of angiotensin II and aldosterone. There are multiple imaging modalities available to evaluate renovascular hypertension. The most common cause of renovascular hypertension is renal artery stenosis, renal arteriography remains the gold standard diagnostic test. Catheter angiography is invasive, costly, time consuming, and can lead to complications such as renal artery dissection or cholesterol embolization. Other imaging tests include duplex ultrasonography, computed tomography with angiography (CTA), and magnetic resonance angiography (MRA). Hypertension control is a prominent goal. ACEIs and ARBs are considered the first-line options, These agents should be initiated with particular care, and an estimated GFR (eGFR) decline of >30% should further evaluation of the patient for revascularization. In cases of bilateral RAS or RAS in solitary kidneys, ACEIs and ARBs should be avoided and the patient evaluated directly for revascularization. Several anti-hypertensive agents are needed to achieve the BP targets, selection of which should follow the general guidelines and include dihydropyridine calcium channel blockers (CCBs), diuretics of appropriate class and dose, β -blockers and second-line agents.

Keywords : secondary hypertension, renovascular disease, renal artery stenosis, renal arteriography, revascularization

SYMPOSIUM 7

Volume Salt Sensitivity in Aldosterone: Why Asia is Different?**Ni Made Hustrini**

FKUI/RSCM

Abstract

“Salt sensitivity of blood pressure is a well-recognized phenomenon in which dietary sodium intake disproportionately affects blood pressure, with significant implications for cardiovascular risk. Aldosterone, a key regulator of sodium and volume homeostasis, plays a central role in mediating salt sensitivity. While salt-sensitive hypertension is observed globally, emerging evidence indicates that Asian populations exhibit unique patterns of volume and salt responsiveness, often at lower levels of sodium intake than Western cohorts. This disparity is thought to result from a combination of genetic, dietary, and environmental factors that influence aldosterone physiology and renal sodium handling.”

Salt-sensitive hypertension is characterized by dysfunction of the renin–angiotensin–aldosterone system (RAAS), leading to increased systemic vascular resistance and elevated blood pressure. Under normal conditions, low salt intake activates RAAS to maintain sodium balance, while high salt intake suppresses RAAS. In salt-sensitive individuals, this regulatory mechanism is impaired, with blunted renin stimulation during salt depletion and inadequate renin suppression during high salt intake, resulting in bidirectional dysregulation of renin activity.

Genetic studies have identified polymorphisms in genes regulating the renin–angiotensin–aldosterone system (RAAS) that are more prevalent in Asian populations, predisposing individuals to enhanced sodium retention and volume expansion.

In addition to systemic RAAS abnormalities, activation of the intrarenal renin–angiotensin system plays a critical role in the development of

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salt-sensitive hypertension and kidney injury. Experimental models demonstrate that salt loading enhances intrarenal RAS activity, contributing to proteinuria, glomerular injury, and renal fibrosis. These effects are further amplified by immune cell infiltration and oxidative stress, highlighting the contribution of inflammatory mechanisms to disease progression.

At the molecular level, the mineralocorticoid receptor (MR) is a key mediator of salt-induced blood pressure elevation through both aldosterone-dependent and aldosterone-independent pathways. In salt-sensitive individuals, MR activation may occur despite low circulating aldosterone levels due to stimulation of Rac1, a Rho-family GTPase that directly activates MR. MR signaling upregulates serum and glucocorticoid-regulated kinase 1 (SGK1), which enhances the activity of epithelial sodium channels (ENaC) and the Na⁺-Cl⁻ cotransporter (NCC), leading to increased renal sodium reabsorption and volume expansion.

Renal sympathetic nervous system overactivation further contributes to salt sensitivity by promoting sodium retention through β 2-adrenergic receptor-mediated suppression of WNK4 and subsequent activation of NCC. The complex interplay among RAAS dysregulation, MR signaling, Rac1 activation, renal sodium transporters, sympathetic activation, and immune responses provides a mechanistic basis for excessive sodium retention and blood pressure elevation in salt-sensitive hypertension, while also identifying potential therapeutic targets such as MR antagonists, ENaC inhibitors, and modulation of renal sympathetic activity.

Additionally, dietary patterns, including high salt intake from traditional foods and processed diets, exacerbate this sensitivity. Epidemiological data suggest that even modest increases in sodium intake can trigger exaggerated blood pressure responses in Asian individuals, contributing to higher prevalence rates of hypertension and associated cardiovascular complications, such as stroke and heart failure.

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Asia is considered different in salt sensitivity and aldosterone-related volume regulation because several biological, genetic, dietary, and environmental factors converge, making salt-induced blood pressure elevation more pronounced than in many Western populations.

1. Higher prevalence of salt-sensitive hypertension

Asian populations show a higher prevalence of salt-sensitive hypertension, where blood pressure rises markedly with sodium intake. This phenotype is more volume-dependent and less renin-driven, meaning that blood pressure elevation occurs even when plasma renin and aldosterone levels are relatively low.

2. Genetic predisposition affecting sodium handling

Genetic variants influencing renal sodium transport are more common in Asian populations. Polymorphisms affecting the renin-angiotensin-aldosterone system, epithelial sodium channels (ENaC), Na⁺-Cl⁻ cotransporters (NCC), and mineralocorticoid receptor (MR) signaling predispose to enhanced sodium retention. These adaptations may reflect evolutionary pressure to conserve salt in historically low-sodium environments, which becomes maladaptive in modern high-salt diets.

3. Low-renin, volume-expanded phenotype

Compared with Western populations, Asians more frequently exhibit a low-renin, volume-expanded form of hypertension. Despite lower circulating aldosterone levels, mineralocorticoid receptor activity may remain inappropriately high through aldosterone-independent mechanisms, such as Rac1-mediated MR activation. This leads to exaggerated sodium reabsorption and blood pressure elevation with salt intake.

4. High dietary sodium exposure

Traditional Asian diets often contain high sodium levels from soy sauce, fermented foods, pickled vegetables, and processed foods. Importantly, Asians demonstrate blood pressure increases at lower sodium thresholds compared with other populations, amplifying the cardiovascular impact of dietary salt.

5. Greater susceptibility to stroke and heart failure

Salt-sensitive, volume-dependent hypertension in Asia is strongly associated with a higher risk of stroke and heart failure, particularly heart failure with preserved ejection fraction (HFpEF). This contrasts

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with Western populations, where atherosclerotic coronary disease is more dominant.

6. Enhanced response to volume-targeted therapy

Clinical studies show that Asian patients often respond particularly well to diuretics, mineralocorticoid receptor antagonists, and sodium restriction, supporting the concept that volume and sodium retention play a dominant role in blood pressure regulation in this population.

7. Environmental and early-life influences

Low birth weight, prenatal undernutrition, and early-life salt exposure—more prevalent in parts of Asia—may program long-term renal sodium handling and blood pressure regulation, further increasing salt sensitivity in adulthood.

Physiologically, these differences manifest as a higher proportion of “volume-dependent” hypertension in Asian populations, in which aldosterone-mediated sodium retention plays a dominant role. Clinical studies demonstrate that Asian patients often respond favourably to therapies targeting the mineralocorticoid pathway, including aldosterone antagonists, highlighting the translational relevance of understanding population-specific salt sensitivity. Moreover, this unique physiology may partially explain why standard sodium reduction strategies or antihypertensive regimens developed in Western cohorts may be less effective in some Asian populations without individualized consideration of volume status and aldosterone activity.

References

1. Weinberger MH. Salt sensitivity of blood pressure in humans. *Hypertension*. 1996.
2. Elijovich F, Weinberger MH, Anderson CA, Appel LJ, Burszty M, Cook NR, et al. Salt sensitivity of blood pressure: a scientific statement from the American Heart Association. *Hypertension*. 2016.
3. Fujita T. Mechanisms of salt-sensitive hypertension. *Hypertens Res*. 2014.

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4. Ayuzawa N, Fujita T. Mineralocorticoid receptor activation in salt-sensitive hypertension. *Hypertension*. 2021.
5. Kario K, Ishikawa J, Hoshide S, Pickering TG, Shimada K. Salt sensitivity and cardiovascular risk in Asian populations. *Hypertens Res*. 2003.
6. He FJ, MacGregor GA. Salt reduction and stroke prevention in Asia. *Lancet*. 2010.
7. Nakayama T, Soma M, Takahashi Y, Kanmatsuse K. Genetic polymorphisms of the renin-angiotensin-aldosterone system and hypertension in Japanese populations. *Hypertension*. 2002.
8. Katsuya T, Ishikawa K, Sugimoto K, Rakugi H, Ogihara T. Genetic susceptibility to salt-sensitive hypertension. *J Hypertens*. 2013.
9. Mishra S, Ingole S, Fujita T. Rac1-mineralocorticoid receptor signaling in salt-sensitive hypertension. *Hypertension*. 2018.
10. Brown IJ, Tzoulaki I, Candeias V, Elliott P. Salt intakes around the world: implications for public health. *Circulation*. 2009.
11. Powles J, Fahimi S, Micha R, Khatibzadeh S, Shi P, Ezzati M, et al. Global sodium consumption and death from cardiovascular causes. *BMJ*. 2013.
12. Iwahori T, Miura K, Ueshima H. Sodium intake and cardiovascular disease in Asia. *Hypertens Res*. 2017.
13. Kawarazaki H, Fujita T. Aldosterone and salt-sensitive hypertension. *Hypertension*. 2013.
14. Kario K, Hoshide S, Nishizawa M, et al. Volume control and antihypertensive response in Asian patients. *Hypertension*. 2018.
15. Ito S, Itoh H, Rakugi H, et al. Mineralocorticoid receptor antagonists in Asian hypertension. *Hypertens Res*. 2019.

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SYMPOSIUM 8

CEREBRAL SMALL VESSEL DISEASE IN HYPERTENSIVE PATIENTS WITH OBESITY

dr. Ekawati Dani Yulianti, Sp.S

Cerebral small vessel disease (CSVD) is an “umbrella” term for a group of distinct diseases with overlapping phenotypes caused by pathologies affecting the small arteries, arterioles, capillaries, and venules of the brain. CSVD is commonly classified into sporadic and hereditary cerebral amyloid angiopathy (CAA). The sporadic CSVD is more common and related to aging, hypertension, and metabolic disturbance such as obesity. CSVD could be “silent” or covert for many years before manifesting as stroke, cognitive decline, dementia, or physical dysfunction. CSVD is characterized by hallmark MRI brain feature, including white matter (WM) hyperintensities (WMHs), small subcortical infarcts or lacunes, Visible perivascular spaces (PVSs), microbleeds, intracerebral haemorrhage (ICH), and brain atrophy. Advanced and highly sensitive imaging techniques, such as diffusion tensor imaging (DTI), can detect subtle lesions not visible on conventional MRI.¹

CSVD is estimated to be the cause of 25% of all ischaemic stroke and is the primary factor of haemorrhagic stroke in the elderly population. CSVD is also the most common cause of vascular cognitive impairment and vascular dementia. Its prevalence and the disease burden increase significantly with advancing age, ranging approximately 5% in individuals aged 50 to nearly 100% for people aged 90 years. While there are numerous risk factors, arterial hypertension remains the most significant risk factor. Other risk factors such as diabetes mellitus, obesity, smoking, obstructive sleep apnea, and chronic kidney disease.² Together, arterial hypertension and obesity contribute to the pathogenesis of CSVD via multiple synergistic mechanisms. Chronic arterial hypertension causes brain arteriosclerosis, a hallmark vascular pathology in CSVD. This condition is characterized by degeneration and loss of smooth muscle cells (SMC), Concentric fibrohyalinotic (glassy-

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looking acellular) thickening of the arterial wall, and extracellular matrix accumulation. These pathological changes result in lumen narrowing and significantly impair the brain's ability to autoregulate blood flow.³ Simultaneously, obesity triggers chronic systemic inflammation and alters insulin signaling. Obesity-induced oxidative stress leads to the release of pro-inflammatory cytokines, which compromise the structural integrity of the brain's microvasculature. Ultimately, this process causes blood-brain barrier (BBB) leakage, allowing neurotoxic plasma components to enter the parenchyma. These changes manifest radiologically as White Matter Hyperintensities (WMH) on T2-weighted MRI.⁴

Several guidelines have demonstrated the importance of managing hypertension and obesity in patients with CSVD. The 2021 ESO guidelines state that hypertension is the strongest risk factor for covert CSVD and recommend administering antihypertensive agents to CSVD patients with a blood pressure $\geq 140/90$ mmHg to prevent lesion progression. These guidelines also state that intensive systolic blood pressure targets (e.g., <120 or <130 mmHg) are more effective at slowing WMH progression compared to standard targets.⁵ A study by Wang et al, demonstrated that patients with high sagittal abdominal diameter (SAD) and obesity (BMI >30 kg/m²) exhibited a 3.6-fold increased risk of dementia (HR 3.60; 95% CI 2.85-4.55) over a 36-year follow-up period. PREVENT-Dementia study highlights the importance of early management of arterial hypertension and obesity. It concludes that managing of arterial hypertension and obesity during mid-life is crucial to reduce the risk of vascular cognitive impairment and mixed dementia.⁶

The management of cSVD requires early and intensive intervention focusing on both hemodynamic and metabolic health. By prioritizing blood pressure control and lifestyle modifications during midlife, the global burden of vascular cognitive impairment and mixed dementia can be significantly reduced.

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Reference:

1. Muir RT, Smith EE. The Spectrum of Cerebral Small Vessel Disease. *Neurol Clin* 2024; 42: 663–688.
2. Cannistraro RJ, Badi M, Eidelman BH, et al. CNS small vessel disease. *Neurology* 2019; 92: 1146–1156.
3. Dupré N, Drieu A, Joutel A. Pathophysiology of cerebral small vessel disease: a journey through recent discoveries. *Journal of Clinical Investigation*; 134. Epub ahead of print May 15, 2024. DOI: 10.1172/JCI172841.
4. Wang M, Norman JE, Srinivasan VJ, et al. Metabolic, inflammatory, and microvascular determinants of white matter disease and cognitive decline. *Am J Neurodegener Dis* 2016; 5: 171–177.
5. Wardlaw JM, Debette S, Jokinen H, et al. ESO Guideline on covert cerebral small vessel disease. *Eur Stroke J* 2021; 6: CXI–CLXII.
6. Low A, Prats-Sedano MA, McKiernan E, et al. Modifiable and non-modifiable risk factors of dementia on midlife cerebral small vessel disease in cognitively healthy middle-aged adults: the PREVENT-Dementia study. *Alzheimers Res Ther* 2022; 14: 154.

LUNCH SYMPOSIUM 3

Update Neuroprotectant on Cascade Ischemic Injury

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Ischemic stroke is a major medical and social burden due to its high prevalence, high mortality, and high rates of long-term disability. In ischemic stroke, vascular occlusion results in reduced cerebral blood flow, leading to decreased delivery of oxygen and glucose to the brain tissue. This initiates the ischemic cascade, causing disruption of cellular metabolism, impairment of energy production, and activation of biochemical processes that culminate in neuronal cell death. If not treated early, the ischemic cascade may trigger secondary inflammatory

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responses, cerebral edema, and brain herniation, which are common causes of mortality in ischemic stroke.

In several countries, including the Russian Federation, therapeutic strategies for acute ischemic stroke include pharmacological agents aimed at modulating cerebral metabolism, strengthening resistance to hypoxia and ischemia, and promoting endogenous repair mechanisms. Cytoflavin is an agent that has been extensively studied in the management of acute ischemic stroke. Cytoflavin exerts its effects by supporting key stages of cellular respiration: glycolysis, pyruvate oxidation, the Krebs cycle, and the electron transport chain, thus effectively targeting critical components of the ischemic cascade.

Cytoflavin is a combination of riboflavin (vitamin B2), nicotinamide (vitamin B3), inosine, and succinic acid, each of which plays a complementary role in mitochondrial energy metabolism. Due to its cytoprotective, antihypoxic, and antioxidant properties, Cytoflavin contributes to the restoration of impaired energy metabolism during cerebral ischemia and may attenuate the progression of the ischemic cascade in patients with ischemic stroke.

Keywords: Ischemic stroke; ischemic cascade; Cytoflavin.

Abstract Speaker

LUNCH SYMPOSIUM 4

Hypertension Care Performance in Indonesia: Evidence from Three Waves of Nationally Representative Cross-Sectional Surveys

Farizal R. Muharram, Indah S. Widyahening, Goodarz Danaei.

ABSTRACT

Objectives: To examine national trends and determinants of hypertension diagnosis, treatment, and control in Indonesia, and to identify factors influencing the performance of hypertension care across three waves of national health surveys.

Design: Repeated cross-sectional analysis of three nationally representative health surveys (2013, 2018, and 2023).

Setting: Household-based, population-level surveys conducted across all provinces of Indonesia, representing primary healthcare settings.

Participants: Adults aged ≥ 18 years included in the 2013, 2018, and 2023 Indonesian National Health Research surveys (RISKESDAS and SKI). Participants with complete blood pressure measurements and information on diagnosis and treatment were included; those with missing data were excluded. The weighted sample sizes were representative of Indonesia's adult population by sex, age group, and urban-rural residence.

Primary and secondary outcome measures: Primary outcomes were hypertension prevalence, diagnosis, treatment, and control rates. Secondary analyses assessed sociodemographic, economic, and health system factors associated with each stage of the hypertension care cascade using multivariate logistic regression. All estimates were adjusted for survey design and population weights.

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Results: Hypertension crude prevalence increased from 27.9% (95% CI 27.7–28.2) in 2013 to 31.6% (31.4–31.8%) in 2023. Diagnosis rates declined from 33.0% in 2013 to 24.1% in 2018, then slightly rose to 26.9% in 2023. Treatment rates doubled from 10.4% to 22.4% over the decade, corresponding to an estimated 10 million additional adults receiving antihypertensive therapy. However, control rates improved only modestly, from 2.3% to 4.2%, leaving over 95% of hypertensive adults with uncontrolled blood pressure. Women, urban residents, and individuals in higher wealth quintiles had consistently better outcomes across all stages of care.

Conclusions: From 2013 to 2023, the prevalence of hypertension increased, while diagnosis rates declined slightly in Indonesia. Although treatment coverage improved substantially, blood pressure control remained poor and socioeconomic disparities widened. Highlight the persistent gaps in access to and quality of hypertension care, as well as the need for equitable, system-level interventions to strengthen primary care management of chronic diseases.

Keywords: Hypertension, Care Cascade, National Survey, Indonesia

LUNCH SYMPOSIUM 4

Hypertension Profile of Indonesian Patients at Risk of Kidney Disease

Maruhum Bonar Marbun

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Background: Hypertension is a massive global health challenge, affecting an estimated 1.1 to 1.3 billion adults and serving as a primary driver for cardiovascular disease and premature mortality. In Indonesia, national surveys (Riskesdas) show a substantial prevalence exceeding

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25–30% among adults, with significant regional disparities and suboptimal rates of awareness and control.

The Bidirectional Link: Hypertension and CKD

The relationship between high blood pressure and Chronic Kidney Disease (CKD) is complex and bidirectional: hypertension is both a leading cause and a frequent consequence of renal impairment. Sustained elevated blood pressure causes direct injury to the glomeruli and renal vasculature, leading to nephrosclerosis and a progressive decline in the estimated Glomerular Filtration Rate (eGFR). Key physiological mediators in this process include glomerular hyperfiltration, intraglomerular hypertension, overactivation of the Renin-Angiotensin-Aldosterone System (RAAS).

Profiling the High-Risk Indonesian Patient

Indonesian patients at the highest risk for CKD typically fall into older age groups or have a history of long-standing hypertension. This risk is further intensified by high rates of comorbidities, including diabetes, obesity, dyslipidemia and smoking. Data indicates that within hypertensive cohorts, 10–30% already exhibit albuminuria (micro or macro), and the prevalence of reduced eGFR (<60 mL/min/1.73 m²) increases significantly with age.

Current Gaps in Management

Several critical gaps hinder effective care in Indonesia. There is a notable underdiagnosis of CKD due to low rates of routine urine albumin testing in primary care. Furthermore, while creatinine measurements are often available, they are not consistently interpreted for formal CKD staging. Pharmacologically, there is an under-prescription of renoprotective agents like ACE inhibitors (ACEi) and Angiotensin Receptor Blockers (ARB), alongside limited access to newer treatments like SGLT2 inhibitors.

Recommendations for the Future

To improve outcomes, there is a multi-level strategy:

- Clinical Interventions: Standardize routine screening for albuminuria and eGFR for hypertensive patients over 60 or those with diabetes.

Abstract Speaker

Prioritize RAAS blockade and individualized blood pressure targets.

- Public Health & Systems: Strengthen primary care referral pathways, implement KDIGO risk stratification protocols, and launch public awareness campaigns to emphasize the link between hypertension and kidney health.

References:

1. Mayne KJ, Hanlon P, Lees JS. Detecting and managing the patient with chronic kidney disease in primary care: A review of the latest guidelines. *Diabetes, Obesity and Metabolism*. 2024 Nov;26:43-54.
2. Delrue C, Speeckaert MM. Beyond Blood Pressure: Emerging Pathways and Precision Approaches in Hypertension-Induced Kidney Damage. *International Journal of Molecular Sciences*. 2025 Aug 6;26(15):7606.
3. Udani S, Lazich I, Bakris GL. Epidemiology of hypertensive kidney disease. *Nature Reviews Nephrology*. 2011 Jan;7(1):11-21.
4. Hamrahian SM, Falkner B. Hypertension in chronic kidney disease. *Adv Exp Med Biol*. 2017 Jan 1;956(956):307-25.
5. Griffin KA. Hypertensive kidney injury and the progression of chronic kidney disease. *Hypertension*. 2017 Oct;70(4):687-94.
6. Pugh D, Gallacher PJ, Dhaun N. Management of hypertension in chronic kidney disease. *Drugs*. 2019 Mar 1;79(4):365-79.

Abstract Speaker

SYMPOSIUM 10

Mild Cognitive Impairment in Hypertension: More Devastating Than It Seems

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Abstract

Hypertension is a well-established cause of cardiovascular and renal target organ damage, yet its impact on the brain often remains under-recognized, particularly in community settings. Increasing evidence suggests that the brain may be one of the earliest organs affected by chronic blood pressure elevation. Long before overt stroke or dementia develops, hypertension can give rise to mild cognitive impairment (MCI), representing an invisible but clinically meaningful form of subclinical organ damage.

Hypertensive cognitive impairment is predominantly vascular in origin. Chronic elevation of blood pressure promotes cerebral small-vessel disease, endothelial dysfunction, and impaired neurovascular coupling, leading to subtle but progressive disruption of frontal-subcortical networks. As a result, early cognitive changes typically involve executive function, attention, and processing speed rather than prominent memory loss. This vascular cognitive impairment (VCI) phenotype often escapes routine clinical detection, despite its association with reduced treatment adherence, impaired self-care, and increased risk of future cerebrovascular events.

Detecting subclinical hypertensive brain damage in the community requires pragmatic and scalable approaches. Global cognitive screening

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tools such as the Mini-Mental State Examination and the Montreal Cognitive Assessment (MoCA-INA) provide accessible entry points but may underestimate early vascular changes. Executive-focused tests—including the Trail Making Test, Digit Symbol Substitution Test, and Clock Drawing Test—are more sensitive to frontal-subcortical dysfunction and may better capture early hypertensive brain involvement. When combined with blood pressure history, duration of hypertension, and blood pressure variability, cognitive screening can serve as a functional marker of early brain organ damage, analogous to left ventricular hypertrophy or microalbuminuria in other organ systems.

The identification of MCI in hypertension has important therapeutic implications. Pharmacological blood pressure control remains the cornerstone of prevention, with emphasis on early, sustained, and stable control to limit cumulative vascular injury. Lifestyle-based interventions further support cognitive resilience. In addition, emerging non-pharmacological neuromodulation techniques suggest that hypertensive cognitive dysfunction reflects modifiable network-level vulnerability, reinforcing the value of early detection.

In conclusion, mild cognitive impairment in hypertension represents subclinical brain damage that is more devastating than it appears. Incorporating cognitive assessment into community hypertension programs may help uncover this invisible burden and promote more holistic, preventive care.

Keywords: Hypertension; Mild Cognitive Impairment; Vascular Cognitive Impairment; Subclinical Brain Damage; Cognitive Screening; Executive Dysfunction

Abstract Speaker

SYMPOSIUM 10

Bidirectional detrimental association of Hypertension and Atrial Fibrillation, and How to Treat

Ario Soeryo Kuncoro.MD

Abstract

Background: Hypertension and atrial fibrillation (AF) frequently coexist and together represent a major contributor to global cardiovascular morbidity and mortality. Hypertension is the most prevalent and modifiable risk factor for AF, influencing both its development and clinical consequences, particularly stroke and heart failure.

Key highlights: Large population-based cohort studies and meta-analyses involving over 20 million individuals demonstrate that hypertension is associated with a 40–50% increased risk of incident AF, with a clear dose–response relationship. Each 20 mmHg increase in systolic blood pressure is associated with an approximately 15–20% higher AF risk, extending into the high-normal blood pressure range. Hypertension promotes AF through left ventricular hypertrophy, diastolic dysfunction, left atrial enlargement, fibrosis, and neurohormonal activation. In randomized and observational studies, effective blood pressure lowering has been associated with a 30–50% reduction in new-onset AF, highlighting the importance of primary prevention. In patients with established AF, hypertension is present in 60–70% of cases and independently increases thromboembolic risk, contributing to stroke risk stratification and outcomes, underscoring its role in secondary prevention.

Key messages: Hypertension should be recognized as a central, actionable target for both primary prevention of AF and secondary prevention of AF-related complications. Early blood pressure optimization, integrated risk-factor modification, and vigilant AF

detection in high-risk hypertensive patients are essential strategies to reduce AF burden, stroke, and long-term cardiovascular events.

Key words: hypertension, atrial fibrillation, primary prevention, secondary prevention.

SYMPOSIUM 10

Spectrum of Subtle Signs Towards Renovascular Complication of Hypertension in the Community

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ABSTRACT

Hypertension remains one of the leading global health challenges, affecting more than 1.4 billion adults worldwide and contributing substantially to disability-adjusted life years (DALYs) and premature mortality. Elevated systolic blood pressure is linearly associated with cardiovascular and renal morbidity, with chronic kidney disease (CKD) emerging as one of the most significant long-term complications of hypertension. Although the individual risk of end-stage renal disease (ESRD) among patients with essential hypertension is relatively low, the high population prevalence of hypertension might contribute to a considerable public health burden in the near future.

Persistent hypertension induces structural and functional alterations in the renal vasculature through endothelial dysfunction, activation of the renin-angiotensin-aldosterone system, oxidative stress, and inflammatory pathways. These mechanisms promote progressive thickening and sclerosis of small renal arteries and arterioles, representing a key renovascular manifestation of hypertensive target

organ damage. Renal damage typically progresses slowly over the decades, but may accelerate in cases of severe or poorly controlled hypertension.

Renovascular complications represent a critical but often underrecognized spectrum of hypertensive target organ damage. Renal artery stenosis, due to atherosclerosis or fibromuscular dysplasia, may act both as a cause and consequence of hypertension, leading to ischemic nephropathy, resistant hypertension, flash pulmonary edema, and increased cardiovascular risk. Sustained renal hypoxia, microvascular rarefaction, and tubulointerstitial fibrosis ultimately contribute to irreversible CKD and ESRD. Thereby, early recognition of renovascular involvement is essential to prevent irreversible renal damage and reduce the broader impact of hypertension on community health.

Keywords: Hypertension; Renovascular complications; Renal artery stenosis; Ischemic nephropathy; Chronic kidney disease.



Free Paper Abstract



***EMPOWERING COMMUNITIES,
PERSONALIZING CARE OF HYPERTENSION
AND CARDIO-CEREBRO-RENAL
COMPLICATIONS***

selected abstract will be published in Journal of
Hypertension (Official international journal of ISH and ESH)

Young Investigator Award

YOUNG INVESTIGATOR AWARD

Saturday, Februari 14th - Venue: Ballroom 1

YIA NUMBER	TITLE	NAME	INSTITUTION
YIA001	Comparison of Left Atrial Strain Values in Ischemic Stroke Patients with Hypertension and Ischemic Stroke Patients without Hypertension	Budiman Ade Satria	RSUP dr. M. Djamil
YIA002	Hypertension-Related Arterial Stiffness and Deep Cerebral Microbleeds in Cerebral Small Vessel Disease: Genetic Evidence from Mendelian Randomization	Elvan Wiyarta	FKUI-RSCM
YIA003	The Nitric Oxide Synthase 3 G894T Polymorphism is Associated with Hypertension in Indonesian Melanesians: A Step Toward Precision Medicine in Eastern Indonesia	Widyan P. Anantawikrama	FKUI-RSPJNHK
YIA004	EARLY BLOOD PRESSURE CONTROL AND MEDIUM-TERM GRAFT OUTCOMES IN LIVING DONOR KIDNEY TRANSPLANTATION	Ghea De Silva	FK UGM/RSUD Dr. Sardjito
YIA005	Hypertensive Emergency in Children with Chronic Kidney Disease: Association of Dipstick Proteinuria Severity with In-Hospital Mortality, 1-Year Mortality, and 1-Year Emergency Hospitalization	Silmi Kaffah	FK Unsri-RSUD Dr. Mohammad Husin

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YIA001

Comparison of Left Atrial Strain Values in Ischemic Stroke Patients with Hypertension and Ischemic Stroke Patients without Hypertension

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Background: Left atrial (LA) dysfunction is a critical risk factor in the pathophysiology of ischemic stroke, serving as both an embolic source and a marker of underlying atrial cardiopathy. Chronic hypertension triggers cardiac remodeling, often beginning with functional impairment before overt structural changes occur. Assessment of LA reservoir strain using speckle tracking echocardiography (STE) provides a more sensitive evaluation of myocardial deformity compared to conventional volume parameters.

Objective: This study aimed to compare LA reservoir strain values between ischemic stroke patients with and without hypertension to evaluate the impact of hypertensive pressure overload on left atrial function.

Methods: An analytical observational study with a cross-sectional design was conducted on 66 ischemic stroke subjects (33 with hypertension and 33 without hypertension). LA reservoir strain was measured using two-dimensional speckle tracking echocardiography (2D-STE). Comparative analysis was performed using the Independent T-Test in SPSS version 26 to assess mean differences in functional and structural cardiac parameters between the two groups.

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Results: There was a statistically significant difference in the mean LA reservoir strain values between the two groups ($p=0.005$). Ischemic stroke patients with hypertension demonstrated significantly lower LA reservoir strain compared to the non-hypertensive group ($18.37\pm 6.68\%$ vs. $23.48\pm 7.39\%$). Despite this marked functional decline, the structural parameter, Left Atrial Volume Index (LAVI), did not show a statistically significant difference (26.06 ± 12.95 vs. 22.95 ± 10.20 mL/m², $p=0.263$). Additionally, a significant difference was found in the mean age of subjects ($p=0.022$), while no differences were observed in ejection fraction (EF) ($p=0.149$), blood pressure during examination, or heart rate ($p>0.05$).

Conclusion: Hypertension is significantly associated with a reduction in left atrial reservoir function in ischemic stroke patients. These findings confirm that intrinsic impairment of left atrial function precedes structural atrial dilatation; thus, LA strain assessment may serve as a more sensitive diagnostic parameter in identifying thromboembolic risk in stroke patients with hypertensive comorbidities.

Keywords: *Left Atrial Strain, Ischemic Stroke, Hypertension, Speckle Tracking Echocardiography, Atrial Cardiopathy.*

YIA002

Hypertension-Related Arterial Stiffness and Deep Cerebral Microbleeds in Cerebral Small Vessel Disease: Genetic Evidence from Mendelian Randomization

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ABSTRACT

Background: Hypertension is the leading modifiable determinant of cerebral small vessel disease (CSVD), yet the causal contribution of

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arterial stiffness, beyond systolic blood pressure (SBP), remains unclear.

Objective: This study aimed to delineate the genetic effects of SBP and arterial stiffness on deep cerebral microbleeds (dCMB), a specific marker of CSVD.

Method: We conducted a two-sample Mendelian randomization (MR) study using genome-wide association study (GWAS) data. Genetic instruments for SBP were derived from over 1,000,000 participants of European ancestry, and instruments for arterial stiffness were proxied by carotid–femoral pulse wave velocity (cfPWV) from approximately 6,400 individuals. Variants were selected at predefined thresholds and LD-clumped ($r^2 < 0.001$, 10,000 kb). dCMB data were obtained from a meta-analysis of approximately 25,800 individuals. Causal effects were estimated using inverse-variance weighted, weighted median, MR-Egger, and multivariable MR approaches.

Result: After clumping, 455 independent SNPs instrumented SBP and 8 SNPs instrumented cfPWV, with strong instrument strength for SBP (mean F: 74.3) and adequate strength for cfPWV (mean F: 22.9). In univariable MR, genetically predicted SBP was positively associated with dCMB (OR 1.028, 95%CI 1.011–1.047; $p = 0.0016$), whereas cfPWV showed a positive but imprecise total effect (OR 3.08, 95%CI 0.26–36.38). In multivariable analyses including 4 overlapping SNPs, cfPWV demonstrated a strong direct association with dCMB (OR 6.34, 95%CI 2.11–19.04), while the direct effect of SBP was attenuated after adjustment for cfPWV.

Conclusion: These findings provide genetic evidence that hypertension related arterial stiffening contributes to CSVD beyond SBP.

Keywords: Hypertension; cerebral small vessel disease; cerebral microbleeds; arterial stiffness; Mendelian randomization

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YIA003

The Nitric Oxide Synthase 3 G894T Polymorphism is Associated with Hypertension in Indonesian Melanesians: A Step Toward Precision Medicine in Eastern Indonesia

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ABSTRACT

Background: Hypertension genetics are population-specific, yet Melanesian communities in Eastern Indonesia are understudied. Evidence suggest Melanesians in Indonesia exhibit attenuated antihypertensive responses to ACEi. Previous studies indicate NOS3 G894T is associated with hypertension in specific ethnicities and may predicts superior response to CCB compared to ACEi.

Objective: This study investigates the association between the NOS3 G894T polymorphism and hypertension susceptibility among the Melanesian population in Morotai Island, Indonesia.

Method: This population-based study on Morotai Island enrolled Melanesian adults with 276 hypertensive case and 185 normotensive controls (n=461). NOS3 G894T was genotyped using qPCR assay. Associations were tested using χ^2 and logistic regression. Multivariable logistic regression adjusted for age, sex, body mass index, smoking, diabetes mellitus, dyslipidemia, and native Morotai ethnicity.

Result: Genotype distribution differed between cases and controls (p=0.037). Under the dominant model, GT+TT carriers had increased hypertension risk (OR 1.675;95%CI 1.094–2.560;p=0.017), while the recessive model was not significant. The G allele was more common

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in controls, consistent with a protective association (OR 1.62;95%CI 1.10–2.39;p=0.013). GT+TT carriers had higher systolic blood pressure than GG (mean difference 12.15 mmHg;p<0.001). In adjusted analysis, NOS3 G894T remained independently associated with hypertension (aOR1.840;95%CI 1.160–2.918;p=0.010), alongside age, smoking, and native Morotai ethnicity.

Conclusion: This first-ever genetic association study in the Melanesian population of Indonesia demonstrates NOS3 G894T T-allele is independently associated with hypertension and higher systolic blood pressure in Indonesian Melanesians, supporting population-specific risk stratification and prospective studies linking genotype to antihypertensive response.

Keywords: Hypertension, Genetics, NOS3 G894T, Melanesian, Precision Medicine.

YIA004

EARLY BLOOD PRESSURE CONTROL AND MEDIUM-TERM GRAFT OUTCOMES IN LIVING DONOR KIDNEY TRANSPLANTATION

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ABSTRACT

Background: Post-transplant hypertension affects 50-80% of kidney transplant recipients and associated with worse long-term graft

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outcomes. However, the relationship between early blood pressure control and medium-term graft function in living donor recipients remains unclear.

Objective: To evaluate the association between blood pressure at one month post-transplantation and graft function at six months in living donor kidney transplant recipients.

Methods: A retrospective cohort study was conducted using medical records of living donor kidney transplant recipients at Dr. Sardjito General Hospital, Yogyakarta, from January 2023 to July 2025. Blood pressure measurements including systolic blood pressure (SBP), diastolic blood pressure (DBP) and mean arterial pressure (MAP) were obtained at one month post-transplantation. Graft function was assessed at six months using estimated glomerular filtration rate (eGFR) and serum creatinine. Pearson correlation analysis was performed.

Results: Thirty-six patients were included (80.6% male, mean age 39.39 ± 12.80 years). At one month, 72.2% were not hypertensive, with mean SBP of 125.44 ± 20.35 mmHg, DBP of 78.64 ± 10.96 mmHg and MAP of 94.24 ± 12.83 mmHg. At six months, mean eGFR was 66.16 ± 20.96 mL/min/1.73m² and mean serum creatinine was 1.43 ± 0.42 mg/dL. No significant correlations were found between one-month blood pressure and six-month graft function: SBP with eGFR ($r=0.086$, $p=0.638$) and creatinine ($r=-0.144$, $p=0.431$); DBP with eGFR ($r=0.059$, $p=0.747$) and creatinine ($r=-0.007$, $p=0.970$); MAP with eGFR ($r=0.078$, $p=0.671$) and creatinine ($r=-0.076$, $p=0.675$).

Conclusion: Blood pressure at one month post-transplantation showed no significant association with graft function at six months in living donor kidney transplant recipients. Longer follow-up may be needed to detect the prognostic value of early blood pressure control.

Keywords: kidney transplantation; living donor; blood pressure; graft function; hypertension.

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YIA005

Hypertensive Emergency in Children with Chronic Kidney Disease: Association of Dipstick Proteinuria Severity with In-Hospital Mortality, 1-Year Mortality, and 1-Year Emergency Hospitalizations**Silmi Kaffah¹, Eka Intan Fitriana², Hertanti Indah Lestari²**

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ABSTRACT

Background: Practical prognostic markers for pediatric hypertensive emergency in chronic kidney disease (CKD) are limited. Dipstick proteinuria is an inexpensive bedside test that may support early risk stratification.

Objective: To evaluate the association of dipstick proteinuria severity with in-hospital mortality, 1-year mortality, and 1-year emergency hospitalizations in children with CKD admitted for hypertensive emergency.

Methods: Retrospective cohort at Mohammad Hoesin Hospital (January 2023–January 2025). Dipstick proteinuria within 24 hours was graded 0–3 and analyzed primarily as grade 0–1 versus 2–3; linear-by-linear association tested trends across grades. Outcomes were in-hospital mortality, 1-year all-cause mortality (Cox regression), and >1 emergency hospitalization within 1 year after index discharge (follow-up available). In-hospital mortality models used parsimonious adjustment (age, eGFR, dialysis/ESKD status).

Results: 974 children were admitted to the PICU; 63 children with CKD had hypertensive emergency (6.5%), and 51 were included after exclusions. In-hospital mortality was 23.5% and 1-year mortality was 60.8%. Mortality increased across proteinuria grades ($p=0.009$). Grade

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2–3 proteinuria was associated with higher in-hospital mortality (aOR 3.13; 95% CI 1.24–7.89; $p=0.015$) and higher 1-year mortality (HR 3.15; 95% CI 1.48–6.69; $p=0.003$). Proteinuria was not associated with >1 emergency hospitalization (RR 1.09; 95% CI 0.68–1.77; $p=0.716$).

Conclusion: Higher dipstick proteinuria severity at presentation was associated with increased short- and long-term mortality in pediatric CKD with hypertensive emergency. Rehospitalization should be interpreted considering competing risk from death and limited event numbers for adjustment.

Keywords:

Dipstick Proteinuria; Pediatric Hypertensive Emergency; Chronic Kidney Disease; Mortality; Emergency Hospitalization

Moderated Poster

MODERATED POSTER SCHEDULE

Saturday, Februari 14th - Venue: Foyer of Ballroom 1

MP NUMBER	TITLE	NAME
MP001	Hyperkalemia Presenting as Sinus Arrest with Junctional Escape Rhythm in a Patient Receiving Candesartan and Spironolactone in a Resource-Limited Setting: A Case Report	Delta Iswara
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MP-001

Hyperkalemia Presenting as Sinus Arrest with Junctional Escape Rhythm in a Patient Receiving Candesartan and Spironolactone in a Resource-Limited Setting: A Case Report

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Background: Hyperkalemia is a recognized complication of combined spironolactone and angiotensin-converting enzyme inhibitor or angiotensin receptor blocker therapy and may cause life-threatening cardiac conduction disturbances. Importantly, severe bradyarrhythmias can occur even in moderate hyperkalemia, particularly in elderly patients with underlying cardiovascular disease, and management is especially challenging in resource-limited settings with restricted access to urgent dialysis.

Case: We report a 77-year-old woman who presented with recurrent syncope and generalized weakness. Electrocardiography revealed sinus arrest with a junctional escape rhythm. Laboratory evaluation demonstrated moderate hyperkalemia (6.84 mmol/L), accompanied by acute kidney injury, anemia, and mild metabolic acidosis. The patient had a history of anterior ST-elevation myocardial infarction and was receiving candesartan and spironolactone as part of her chronic cardiovascular therapy. In the absence of immediate dialysis availability, she was managed in the intensive care unit using a protocol-driven approach consisting of intravenous calcium gluconate for membrane stabilization, repeated glucose-insulin therapy cycles, adjunctive β -adrenergic agonists, and loop diuretics. Serial electrocardiograms showed gradual resolution of sinus arrest, with restoration of a stable

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sinus rhythm in parallel with declining serum potassium levels.

Conclusion: Moderate hyperkalemia associated with combined RAASi and spironolactone therapy can precipitate severe conduction disturbances, including sinus arrest, particularly in elderly patients with impaired renal function. This case underscores the clinical and electrophysiological impact of hyperkalemia and highlights that vigilant monitoring and timely, protocol-driven management can allow safe continuation of RAASi therapy and prevent fatal arrhythmias, even in resource-limited settings.

Keywords: *Hyperkalemia; Sinus arrest; Junctional escape rhythm; Candesartan; Spironolactone; Resource-limited setting.*

MP-002

From Fluctuation to Stability: Addressing Blood Pressure Variability in Heart Failure

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Background: Blood pressure variability (BPV) is an important determinant of cardiovascular outcomes beyond mean blood pressure values. Excessive BPV is associated with recurrent hypertensive crises, acute heart failure decompensation, and increased mortality. In patients with long-standing hypertension and structural heart disease, achieving stable blood pressure control remains a major clinical challenge.

Case Presentation: A 49-year-old woman with long-standing hypertension and a history of mitral and tricuspid valve repair with residual regurgitation presented with recurrent hypertensive emergencies complicated by acute pulmonary edema. Despite preserved to mildly

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reduced left ventricular systolic function, she experienced repeated hospitalizations driven by marked blood pressure fluctuations, with systolic blood pressure ranging from 110 mmHg to more than 260 mmHg. Acute management during each admission followed guideline-recommended treatment for hypertensive emergencies using intravenous vasodilators and diuretics, resulting in prompt clinical improvement. Although acute management resulted in prompt clinical improvement, marked blood pressure variability persisted during hospitalization and frequently recurred after discharge.

Discussion: Management was directed toward reducing BPV rather than further lowering mean blood pressure. Guideline-directed medical therapy for heart failure was maintained, including beta-blocker therapy, renin-angiotensin system inhibition, and mineralocorticoid receptor antagonists. Chronotherapy was optimized by prioritizing long-acting antihypertensive agents and adjusting medication timing, with nifedipine GITS consolidated to a single 60 mg bedtime dose and candesartan 32 mg administered in the evening to attenuate nocturnal and early-morning blood pressure surges. Home blood pressure monitoring was systematically implemented to characterize circadian blood pressure patterns and guide repeated adjustment of medication timing. This targeted approach led to improved blood pressure stability and fewer recurrent hypertensive decompensations.

Conclusion: This case highlights the clinical importance of BPV occurring both in-hospital and after discharge in hypertensive patients with heart failure and structural heart disease. Chronotherapy combined with home blood pressure monitoring, while maintaining guideline-directed heart failure therapy, represents a practical strategy to stabilize blood pressure patterns. Targeting blood pressure stability in addition to achieving guideline-recommended levels below 130/80 mmHg may help reduce recurrent hypertensive emergencies and heart failure hospitalization.

Keywords: Blood pressure variability; chronotherapy; home blood pressure monitoring; hypertensive emergency; heart failure; valvular heart disease

MP-003

Hypertension-Mediated Target Organ Damage in a 19-Year-Old Woman with Dialysis-Dependent Chronic Kidney Disease Presenting with Ischemic Stroke and Seizure : A Case Report

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ABSTRACT

Introduction: Hypertension is a major cause of hypertension-mediated organ damage (HMOD), particularly involving the kidneys and brain. Uncontrolled hypertension may progress to chronic kidney disease (CKD) and increase the risk of ischemic stroke. In young individuals, hypertension is frequently underdiagnosed, leading to severe complications at an early age.

Case Illustration: A 19-year-old woman presented to the emergency department with generalized seizures and dyspnea. She had been diagnosed with CKD four months prior and was undergoing routine hemodialysis. On admission, the patient showed decreased level of consciousness with a Glasgow Coma Scale score of E2V3M4. Blood pressure was 250/140 mmHg with a respiratory rate of 32 breaths per minute. Pupillary response was difficult to assess. Rightward gaze deviation and pathological reflexes were positive.

Discussion: Chronic uncontrolled hypertension leads to hypertension-mediated organ damage through endothelial dysfunction and vascular remodeling, particularly affecting the kidneys and brain. In this patient, long-standing hypertension likely contributed to progression of chronic kidney disease and cerebral small vessel disease manifested as multiple lacunar infarctions. The occurrence of seizure was multifactorial,

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associated with hypertensive encephalopathy, acute ischemic stroke, and metabolic disturbances related to advanced kidney disease.

Results: Laboratory examination showed elevated serum creatinine of 5.18 mg/dL. Chest radiography revealed pulmonary edema, cardiomegaly, and pneumonia. Head computed tomography demonstrated cerebral edema with multiple acute lacunar infarcts in the bilateral parietal lobes and left occipital lobe. The patient was managed with intravenous antihypertensive therapy, antiepileptic drugs, antibiotic treatment, supportive care, and continuation of routine hemodialysis. Blood pressure gradually stabilized, seizures were controlled without recurrence, and clinical condition improved without neurological worsening.

Conclusion: This case highlights severe hypertension-mediated organ damage in a young patient presenting with end-stage kidney disease and ischemic stroke. Early detection of hypertension, evaluation for secondary causes, and strict blood pressure control are essential to prevent catastrophic complications in young populations.

Keywords: Hypertension, Chronic Kidney Disease, Ischemic Stroke, Seizure.

MP-004

Hypertensive Crisis as an Accelerator of Massive Target Organ Damage in a Young Patient with Early Onset Type 2 Diabetes Mellitus : A Case Report from Cardiovascular Complications to Retroperitoneal Hemorrhage

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Introduction: Hypertension in young adults is often aggressive as a primary driver of TOD. This case report examines hypertensive crisis as an accelerator of multiorgan failure in a patient with early-onset T2DM.

Case Illustration: A 30-year-old male with uncontrolled grade 2 hypertension and T2DM presented with acute pulmonary edema due to a hypertensive crisis (215/120mmHg). Manifestations of TOD included HHD, stage 5 CKD, and grade III hypema of the left eye. During hospitalization, the patient developed spontaneous retroperitoneal hemorrhage, triggered by extreme blood pressure fluctuations and chronic vascular dysfunction.

Discussion: This case illustrates a “vascular storm” where a hypertensive crisis accelerates cardiovascular remodeling and vascular rupture in a young patient. The synergistic interaction between resistant hypertension and chronic hyperglycemia triggers catastrophic complications, including rare hemorrhagic manifestations in the retroperitoneal area.

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Results: Aggressive management using iv antihypertensives followed by a multiple oral regimen successfully achieved gradual blood pressure targets. Retroperitoneal hemorrhage and hypema were managed through a conservative approach and hemodynamic optimization. Although acute conditions stabilized, the patient suffered irreversible end-stage renal damage requiring long term routine hemodialysis.

Conclusion: Hypertension in early onset T2DM patients requires aggressive control. Prevention of massive TOD depends on consistent achievement of blood pressure targets to avoid fatal vascular complications during productive years.

Keywords: Hypertensive Crisis; TOD; HHD, Retroperitoneal Hemorrhage; Early-Onset T2DM.

MP-005

Secondary Hypertension Due To IgM-Nephropathy In A Young Man

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Background: The prevalence of hypertension among young adults (<40 years) is 7-11% and secondary causes (5-8%) must be investigated. Glomerulonephritis, such as IgM nephropathy, is one of the secondary cause of hypertension, which is rare in young adult (2-18%).

Case Illustration: A-32-year-old male with swollen legs, foamy urine since 1,5-years and hypertension since the onset of illness (172/105mmHg, pulse 89x/minute). Creatinine serum 1.84mg/dl, Albumin 1.86g/dl, LDL 423mg/dl, proteinuria 4+, hematuria 2+, protein excretion 10.5g/24 hours. ANA, HIV, HbsAg, Anti-HCV were negative. HbA1C, sodium-potassium, TSH-FT4, C3-C4, Chest X-ray, renal doppler ultrasound

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were normal. Renal biopsy showed minimal mesangial proliferation, positive IgM immunofluorescent in the mesangial and glomerular basement membrane. After receiving ACE-inhibitor, calcium channel blocker (CCB), diuretic, mycophenolate-mofetil, and corticosteroids, the blood pressure (BP) remained <130/80mmHg.

Discussion: Hypertension, renal impairment, nephrotic syndrome, and hematuria are characteristic of glomerulonephritis within the focal segmental glomerulosclerosis spectrum and more likely to be IgM Nephropathy variant based on renal biopsy. Pathogenesis of hypertension in glomerulonephritis is due to water/sodium retention, RAAS overactivity, increased sympathetic nervous system activity. According to KDIGO, BP target with proteinuria $\geq 30\text{mg}/24$ hours is $\leq 130/80\text{mmHg}$. Primary treatment is ACE-inhibitor or angiotensin receptor blocker, possibly combined with CCB and immunosuppressants to control disease activity.

Result: This case demonstrates the need for comprehensive examination, especially immune complex-related renal diseases that lead to hypertension in young adult and BP was controlled with ACE-inhibitors and suppresses the immune process with immunosuppressants.

Conclusion: Hypertension in young man due to IgM nephropathy controlled with ACE-inhibitors and immunosuppressants.

Keyword: *Secondary Hypertension; IgM Nephropathy; Young Man*

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MP-006

A Case Series of Suspected Pheochromocytoma Patients Receiving Surgical and Conservative Management at Dr. Sardjito General Hospital

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Background: Pheochromocytoma is a rare tumor originating from chromaffin cells in the adrenal medulla with incidence of 1-4 per 106 population per year. This tumor is known for causing hypertension, and only 50% of the patients present symptoms compatible with this pathology. Clinical presentation varies according to location and degree of catecholamine secretion. This report aims to discuss the diagnostic approach to this tumor and the advantage of early intervention can reduce morbidity and mortality.

Case Illustration: A 38-year-old and 32-year-old woman were referred because of uncontrolled hypertension and tremor. Abdominal MSCT findings: Left suprarenal gland: an isodense lesion with round shape, measuring approximately AP 2.88 × LL 2.57 × CC 2.30 cm. The other patient abdominal MSCT findings: solid mass at Left adrenal gland measuring approximately 1.22 cm × 1.33 cm, suspicious for pheochromocytoma. An adrenalectomy was performed, and blood pressure monitoring after surgery was normal without antihypertensive drugs. The other patient, who received conservative therapy, still had uncontrolled hypertension.

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Discussion: Pheochromocytoma is a neoplasm that can be either benign or malignant and is often associated with familial syndromes. The clinical manifestations of these tumors are primarily due to the excessive secretion of catecholamines, symptoms are present in approximately 50% of patients. Diagnosis is confirmed through biochemical tests measuring the excess production of metanephrines and catecholamines and imaging studies to identify the tumor's location. Surgery is the treatment of choice for these tumors, curable for more than 90% of patients.

Conclusion: Early diagnosis and management are essential to achieve optimal outcomes and minimize the risk of complications.

Keyword: Pheochromocytoma, hypertension, tumor, surgery.

MP-007

Renovascular Hypertension in a Child with Congenital Heart Disease Treated with Percutaneous Transluminal Angioplasty

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Background : Renovascular hypertension is an important cause of secondary hypertension in children but is frequently underrecognized. Persistent elevation of blood pressure during childhood may result in long-term cardiovascular and renal complications. Renal artery stenosis represents a potentially reversible etiology, and percutaneous transluminal angioplasty (PTA) may be considered when adequate blood pressure control cannot be achieved with medical therapy alone.

Case Illustration : We report a pediatric patient referred for evaluation of persistent hypertension, initially detected during a routine ophthalmologic examination. Further assessment confirmed stage II hypertension with suspicion of a secondary cause. The patient had a complex medical

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history, including a perimembranous ventricular septal defect (VSD), prior surgery for Hirschsprung disease, and suspected congenital retinopathy. Renal Doppler ultrasonography revealed significant right renal artery stenosis. Despite optimized antihypertensive therapy and successful transcatheter VSD device closure, hypertension persisted, fulfilling criteria for resistant hypertension. Renal arteriography confirmed subtotal ostial stenosis of the right renal artery. Percutaneous transluminal angioplasty with drug-eluting stent implantation was performed without complications, resulting in substantial blood pressure improvement, reduced antihypertensive requirements, and stable renal function during follow-up.

Conclusion : This case underscores renovascular hypertension as a potentially reversible cause of secondary hypertension in children. Persistent hypertension despite optimized medical therapy should prompt thorough evaluation for secondary etiologies, particularly renal artery stenosis. With appropriate diagnostic assessment and careful patient selection, PTA may achieve meaningful blood pressure control and reduce long-term treatment burden, even in pediatric patients with complex comorbidities.

Keywords: Renovascular hypertension; Pediatric hypertension; Renal artery stenosis; Percutaneous transluminal angioplasty.

MP-008

Improving Blood Pressure Control through a Locally Adapted PROLANIS Intervention Focused on Medication Adherence and Individualized Risk Factor Modification: A Community-based Research Project

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Background: Hypertension remains a major public health problem in Indonesia with a 31.18% prevalence. Although the government has

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implemented the Chronic Disease Management Program (PROLANIS), its implementation in primary care remains suboptimal. At Mahesa Medical Center (MMC), only 9.1% of PROLANIS participants achieved controlled blood pressure (BP). We therefore developed a PROLANIS optimization intervention focusing on medication adherence and individualized risk factor modification.

Objective: This study aimed to evaluate the impact of a locally adapted PROLANIS intervention on blood pressure control among hypertensive PROLANIS participants in primary healthcare care setting.

Methods: This study involved PROLANIS participants in MMC recruited through consecutive sampling. The intervention was delivered weekly over six weeks and consisted of educational sessions supported by the *PROLANIS Terkendali* booklet, which also functioned as a habit-tracking tool. BP was measured using a standardized protocol. Baseline assessments included hypertension knowledge (HKLS), medication adherence (MMAS-8), mental health (SRQ-20), dietary intake (24-hour recall), physical activity (FITT), sleep patterns, and smoking exposure. Participants who didn't complete follow-up were excluded.

Result: A total of 48 participants were included in the final analysis (38 hypertensive, 10 normotensive). Among hypertensive participants, medication adherence increased from 64.5% to 93.1%. Mean systolic BP decreased from 144 ± 19 mmHg to 134 ± 16 mmHg ($p = 0.001$), with no significant change in diastolic BP. No significant BP changes were observed among normotensive participants.

Conclusion: The PROLANIS optimization intervention may improve BP control among hypertensive participants in primary healthcare settings.

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MP-009

Average Real Blood Pressure Variability and Nocturnal Dipping Pattern Correlate with Left Ventricular Mass Index and Diastolic Dysfunction in Hypertensive Patients

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ABSTRACT

Background : Blood pressure variability (BPV) and circadian dysregulation have critical role in adverse cardiac remodeling and functional impairment. Among BPV indices, average real variability (ARV) has potential superiority, as it captures true sequence of reading-to-reading fluctuations, but its relationship with cardiac structural and diastolic alterations remains underexplored.

Objective : To investigate the correlation between ARV with left ventricular mass index (LVMI) and left ventricle diastolic dysfunction (LVDD) and to compare between dipper vs non-dipper phenotypes in hypertensive patients.

Method : This cross-sectional study enrolled all hypertensive patients who had undergone 24-hour ambulatory blood pressure monitoring (ABPM), regardless of treatment status. ARV of SBP and DBP was calculated for 24-hour, daytime, and nighttime periods. LVMI and LVDD were assessed using standard echocardiographic parameters. Patients were further classified into dipper or non-dipper to compare differences in LVMI and LVDD.

Result : A total of 33 hypertensive patients (63.6% women; mean age 53.12 ± 14.56 years; mean BMI 25.99 ± 3.70 kg/m²) were analyzed, resulting in 20 subjects with LVH and 23 non-dippers. 24-hour ARV ($r=0.374, p=0.032$) and nighttime ARV ($r=0.403, p=0.020$) were

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significantly associated with LVMI, whereas daytime ARV correlated significantly with LVDD ($r=0.413, p=0.017$). The non-dipper group exhibited significantly higher LVMI compared to dippers (135.74 ± 8.88 vs. 103.60 ± 8.63 g/m²; $p=0.014$) and a greater prevalence of LVDD (84.6% vs. 15.4%; $p=0.001$).

Conclusion : Our findings validate that ARV is closely associated with both structural and functional cardiac impairment. Higher nocturnal variability is associated with structural hypertrophy, whereas daytime variability is linked to diastolic dysfunction. Non-dipper phenotype has significantly worse cardiac remodeling and dysfunction compared to the dipper profile.

Keyword: *Average Real Variability, Non-Dipper, Dipper, Left Ventricular Mass Index, Diastolic Dysfunction*

MP-010

Dextrose Regimen and Blood Pressure Control in CAPD: A Cross-Sectional Study Comparing Combination and Exclusive 1.5% Solutions

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Background : Blood pressure control remains a significant challenge in patients undergoing Continuous Ambulatory Peritoneal Dialysis (CAPD). The dialysis regimen, particularly the use of glucose-based dialysate at different concentrations (1.5% and 2.5%), influences fluid

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and electrolyte balance, which may impact both the level and variability of blood pressure.

Objective : To compare systolic blood pressure (SBP) and diastolic blood pressure (DBP) between CAPD patients using an exclusive 1.5% dextrose regimen and those using a combination regimen of 1.5% and 2.5% dextrose solutions within a single day.

Methods : This cross-sectional study analyzed data from 31 CAPD patients. Based on daily dialysate usage, subjects were categorized into exclusive 1.5% group (n=6): Using only 1.5% dextrose solution, and combination group (n=25): Using both 1.5% and 2.5% dextrose solution in varying proportions. As no patients used an exclusive 2.5% regimen, analysis focused on comparing these two groups. The non-parametric Mann-Whitney U test was used to compare SBP and DBP between groups. A sensitivity analysis was performed excluding potential outliers.

Results : The mean SBP was significantly higher in the combination group (154.6 ± 22.6 mmHg) compared to the exclusive 1.5% group (121.5 ± 9.4 mmHg), with a mean difference of 33.1 mmHg (95% CI: 18.2 to 48.0; $p = 0.0076$, Mann-Whitney U test). The mean DBP was also higher in the combination group (92.0 ± 9.3 mmHg vs. 83.5 ± 9.6 mmHg), with a mean difference of 8.5 mmHg (95% CI: 0.2 to 16.8; $p = 0.0498$). The proportion of patients with Stage 2 Hypertension (SBP \geq 160 mmHg) was 40% (10/25) in the combination group and 0% (0/6) in the exclusive 1.5% group ($p = 0.042$, Fisher's Exact Test).

Conclusion : The use of a combination dextrose regimen (1.5% and 2.5%) is associated with significantly higher systolic and diastolic blood pressure compared to an exclusive 1.5% regimen in CAPD patients.

Keywords : Blood pressure; dextrose regimen; CAPD

References:

1. Lydia, A. The Role of Continous Ambulatory Peritoneal Dialysis in Equity of Kidney Replacement Therapy in Indonesia. Jurnal

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- Penyakit Dalam Indonesia. 2020;7(3):1-10.
2. Brown EA, Blake PG, Boudville N, Davies S, de Arteaga J, Dong J, et.al. International society for peritoneal dialysis practice recommendation: prescribing high-quality goal-directed peritoneal dialysis. *Peritoneal Dialysis International*. 2020;40(3);244-253.
 3. Auguste BL, Bargman JM. Peritoneal dialysis prescription and adequacy in clinical practice: Core Curriculum. *Am J Kidney Dis*. 2023;81(1):100-109.
 4. Sans MB, Clemente EP, Carmonac AR, Riverad MV, Fontánc MP, Rodríguez-Navarro CQ, et.al. Clinical guideline of adequacy and prescription of the peritoneal dialysis. *Nephrologia*. 2024;44(1); 1-28.

MP-011

Unmasking the Silent Threat: Essential Hypertension as a Powerful Catalyst for Ischemic Stroke through Atrial Myopathy

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Abstract

OBJECTIVES : This study aimed to investigate the potential impact of essential hypertension (EHT) compared to other risk factors on the development of atrial myopathy (AM), which serves as a substrate for thrombus formation, even in the absence of atrial fibrillation (AFib).

BACKGROUND : No available data have been explored to identify the most modifiable risk factor that poses a powerful threat to the occurrence of ischemic stroke (IS) through the AM pathway as a potential substrate.

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METHODS : We conducted a 5-year cross-sectional study, stratifying patients' subgroups according to the Afib progression stages outlined in the New 2023 AFib Guidelines. Stage 1: those are At Risk for AF (N=142); Stage 2: Pre-AF (N=220); Stage 3: Paroxysmal AF (N=83); and Stage 4 (N=77) permanent AFib. Normal control (N=100). Those in stages 2 to 4 have suffered from IS. LA function was measured using 2-D echocardiographic strain analysis with velocity vector imaging.

RESULTS : We demonstrated the gradual reduction of all LA strains from Stage 1 to 5 ($p < 0.0001$). EHT accelerates the progression to AM as a continuum substrate, directly influencing the abnormalities (EHT versus Non-EHT risk factor is 83.10% vs 27.35%, $p < 0.0001$). There is a significant relationship between EHT and AM, [crude OR = 4.10; 95% CI: 2.25 – 7.65; $p = 0.0001$]; and after adjusting for age, there was a significant relationship, OR = 3.41; 95% CI [1.90 - 6.13; $p = 0.0001$].

CONCLUSIONS : Essential hypertension is a powerful risk factor for initiating fibrosis as a substrate due to long-standing pressure overload at the atrial wall, subsequently catalyzing LA dysfunction that triggers thrombus formation and ischemic stroke.

MP-012

Transcriptomic Validation of the Renin-Angiotensin System Feedback Loop in a Salt-Dependent Hypertension Model

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Background: The physiological regulation of blood pressure is heavily dependent on the interplay between body salt levels and plasma renin activity (PRA). Reactive increases in PRA attenuate the fall in blood pressure caused by salt depletion. Conversely, physiological feedback loops suggest that salt loading should suppress renin expression to undetectable levels.

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Objective: This study utilized bioinformatics to validate this genomic response in a mice model of salt-dependent hypertension.

Methods: We obtained high-throughput RNA-sequencing data from the Gene Expression Omnibus (dataset GSE83360). The study population consisted of mice subjected to a deoxycorticosterone acetate (DOCA)-salt hypertension model (high salt/volume overload) versus sham controls. Raw count data was processed using R v4.x to quantify the expression of the renin gene locus (Ren1/Ren2) and housekeeping controls (Gapdh).

Results: Quality control analysis filtered the transcriptomic dataset and detected 55,487 genes. Analysis of the renin-angiotensin system (RAS) components revealed that renin was expressed at negligible levels (FPKM < 0.05) in the DOCA-salt-treated group. The data validates the mechanism that salt loading actively suppresses renin expression which supports the clinical hypothesis that renin levels and salt status are reciprocally regulated variables in the management of hypertension.

Conclusion: Our bioinformatic analysis confirms that the genomic machinery for renin production is highly sensitive to salt status.

Keywords: *Hypertension, Renin, Bioinformatics, Salt Sensitivity, Transcriptomics, DOCA-salt*

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MP-013

Hypertension-Related Arterial Stiffness Does Not Translate into Significantly Reduced Functional Capacity

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Background: Hypertension induces structural and functional changes in large arteries, leading to increased arterial stiffness, which is a well-established cardiovascular risk marker. However, whether hypertension-related arterial stiffness directly translates into impaired functional capacity remains unclear, particularly in clinically stable individuals.

Objective: This study aimed to investigate the association between hypertension-related arterial stiffness, assessed by brachial-ankle pulse wave velocity (baPWV), and functional capacity measured by exercise testing.

Methods: This retrospective study analyzed data from a cardiac rehabilitation registry at Hasan Sadikin Hospital (October–December 2025). Patients scheduled for cardiac rehabilitation underwent baPWV assessment using a non-invasive vascular analyzer and functional capacity evaluation through treadmill exercise testing. Participants were classified according to hypertension status. Comparisons of baPWV and functional capacity between hypertensive and non-hypertensive groups were performed using the Mann–Whitney test. Spearman's correlation and multiple linear regression analyses were conducted to evaluate the relationship between baPWV and functional capacity.

Results: A total of 83 patients were included, with a median age of 60 years (71.1% male). Hypertensive patients had significantly higher baPWV compared with non-hypertensive patients (median 12.42 vs 11.48 m/s; $p=0.010$). However, functional capacity did not differ significantly between the two groups (median 6.8 vs 8.22 METs; $p=0.232$). No significant correlation was observed between baPWV

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and functional capacity ($r_s = -0.138$; $p=0.212$). Multivariable analysis showed that baPWV was not an independent predictor of functional capacity.

Conclusion: Although hypertension is associated with increased arterial stiffness, this structural vascular alteration does not appear to be associated with significantly reduced functional capacity.

Keywords: Hypertension; Arterial Stiffness; Brachial-Ankle Pulse Wave Velocity; Functional Capacity; Exercise Testing

MP-014

Uncovering Molecular Drivers of Refractory Hypertension: A Protein-Protein Interaction Network and Novel Therapeutic Target Discovery Approach

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ABSTRACT

Background: Refractory hypertension is the most severe phenotype of treatment-resistant hypertension, defined as persistently elevated blood pressure despite the concurrent use of five or more antihypertensive agents of different classes. This condition significantly worsens organ damage and cardiovascular burden, yet its molecular drivers remain unclear. Recent biological studies highlight several hub genes involved in refractory hypertension. However, limited research explores their therapeutic potential.

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Objective: To uncover key molecular pathways driving refractory hypertension and identify promising druggable targets for future interventions.

Methods: This study used integrated bioinformatics tools to construct a protein-protein interaction network. Functional enrichment analysis was performed with STRINGS and WEBGSTALT to identify hub genes involved in refractory hypertension. Candidate genes were further validated using ERRAT and PROCHECK to assess their potential as therapeutic targets.

Results: The hub-gene analysis showed that there were 18 genes which are the most contributing genes for the underlying pathomechanisms in refractory hypertension with significant PPI enrichment value ($p < 0.01$) and significant false discovery rate (FDR) value ($p < 0.05$). ERRAT and PROCHECK validation analysis also showed the most contributing genes which are possible to be candidates for novel therapeutic targets for refractory hypertension which are ECE1, BMPR2, and NOS3.

Conclusion: This study shows the candidates for new therapeutic target genes that have the greatest impact on refractory hypertension, namely ECE1, BMPR2, and NOS3. It also highlights opportunities for future research to find agents that could treat these therapeutic target genes in refractory hypertension.

Keywords: *Bioinformatics, Hub Genes, Molecular, Refractory Hypertension, Target*

MP-015

Exploring Cerebral Effects of Hypertension: An Integrated Bioinformatics Analysis in Pulmonary Arterial Hypertension and Amyotrophic Lateral Sclerosis

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Background : Pulmonary Arterial Hypertension (PAH) and Amyotrophic Lateral Sclerosis (ALS) are both progressive disorders. PAH is characterized by elevated artery pressure. Meanwhile ALS is characterized by neurodegeneration of upper and lower motor neurons. Although PAH and ALS affect distinct organ systems, they share similar biological processes including extracellular matrix remodelling and altered cellular activity. The exact mechanisms linking them together are still unknown.

Objective : This study aims to identify common molecular pathways between PAH and ALS.

Methods : Publicly available gene datasets for PAH (GSE193776) and sporadic ALS (GS215364) were obtained from the Gene Expression Omnibus (GEO) database. Differentially expressed genes (DEGs) were identified for each condition and overlapping DEGs were determined to identify shared gene expression changes. Gene ontology analysis was performed to explore the biological processes and pathways associated with these shared genes. Protein-protein interaction network analysis was then used to identify key hub genes.

Results : From our analysis, there were 185 DEGs found, including 108 downregulated, and 77 upregulated genes. Upregulated genes were

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associated with mitotic spindle elongation, external apical plasma membrane activity and tubulin binding. While downregulated genes were associated with collagen fibril organization, collagen-containing extracellular matrix activity, and platelet-derived growth factor binding. KEGG pathway analysis revealed upregulation in the ABC transporter pathway, and downregulation in protein digestion and absorption. PPI analysis identified 10 hub genes: COL5A1, CCN2, POSTN, BGN, LOX, COL5A2, COL1A1, COL1A2, ELN and COL3A1.

Conclusion : This study identifies shared molecular pathways between PAH and ALS despite different clinical presentations. Thus, providing a basis for further investigation into disease mechanisms.

Keywords : *amyotrophic lateral sclerosis, bioinformatics, pulmonary arterial hypertension*

MP-016

A Network Pharmacology Approach to Drug Repurposing for Dual-Targeting of Hypertension and Cerebral Edema

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Background: Hypertensive encephalopathy is characterized by a rapid rise in blood pressure leading to blood-brain barrier (BBB) disruption and cerebral edema. Current pharmacological treatment for hypertension and edema is managed differently, where hypertension requires beta-blockers and the swelling is managed with diuretics. Drug repurposing can be done in order to make treatment more effective and target both at once.

Objective: We aimed to identify single biological targets that drive both systemic vasoconstriction and cerebral fluid accumulation in order to treat the underlying cause of both problems at the same time.

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Methods: We compared two gene target lists, “Essential Hypertension” (C0020538) and “Brain Edema” (C0006114) from DrugBank and DisGeNET. The VennDiagram package in R(v4.x) was used to perform a set intersection analysis to identify overlapping molecular markers. The resulting targets were prioritized based on their “druggability” scores from the dataset. Overlapping genes were defined as dual targets.

Results: The comparative analysis revealed a 30% functional overlap between the two diseases. Three critical genes were identified, namely VEGFA, TNF, and NOS3. VEGFA is identified as the central regulator of both vascular resistance and BBB permeability, NOS3 expresses as a dual mediator of endothelial dilation and neuroprotection. Meanwhile, TNF is shown to mediate both vascular inflammation and astrocyte swelling.

Conclusion: This study suggests that anti-VEGF agents and TNF inhibitors possess a lot of potential for treating hypertensive encephalopathy. Repurposing these agents could provide simultaneous protection of the brain and blood pressure control.

Keywords: *Blood-Brain Barrier, Cerebral Edema, Drug Repurposing, Hypertension, Hypertensive Encephalopathy*

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MP-017

DATA ANALYSIS OF THE EFFICACY AND COMPLICATIONS OF ANTIHYPERTENSIVE THERAPY IN INPATIENTS AT TANGERANG CITY HOSPITAL

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Background : Hypertension is a major public health problem and a leading risk factor for cardiovascular morbidity and mortality. Patients with uncontrolled hypertension often require inpatient care due to the risk of acute complications and target organ damage. In hospital settings, antihypertensive therapy aims to stabilize blood pressure and achieve recommended treatment targets based on clinical guidelines. However, optimal blood pressure control during hospitalization remains challenging, particularly in patients with severe hypertension and comorbidities. Therefore, evaluation of antihypertensive therapy efficacy is essential to improve inpatient hypertension management and support effective treatment strategies within hospital-based clinical practice.

Objective : To analyze the efficacy of antihypertensive therapy and achievement of blood pressure targets among hospitalized hypertensive patients at Tangerang City Hospital.

Method : This study employed a retrospective observational design involving 72 hypertensive inpatients treated at Tangerang City Hospital from January to December 2024. Data were obtained from medical records, including demographic characteristics, hypertension classification, length of stay, antihypertensive therapy patterns, and blood pressure outcomes. Therapeutic efficacy was evaluated based on

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blood pressure targets recommended by the 2017 ACC/AHA guidelines. Data were analyzed descriptively.

Result : Most patients were female (56%), newly diagnosed (64%), and aged 46–55 years (33%). Hypertension classification was dominated by hypertensive crisis (72.22%) and stage 2 hypertension (16.67%). The majority of patients had a length of stay of 1–2 days (54.17%). Antihypertensive therapy generally followed ACC/AHA 2017 guidelines, with predominant use of ACE inhibitors, ARBs, and calcium channel blockers. Captopril and amlodipine were the most frequently prescribed drugs. Only 41.67% of patients achieved the target blood pressure of <130/80 mmHg during hospitalization.

Conclusion : Although antihypertensive therapy patterns largely complied with clinical guidelines, achievement of blood pressure targets among hospitalized patients remained suboptimal. Optimization of inpatient antihypertensive management and continued follow-up are necessary, particularly in patients with severe hypertension.

Keyword : Hypertension; Antihypertensive therapy; Inpatients; ACC/AHA 2017; Blood pressure target

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MP-018

Neutrophil-to-Lymphocyte Ratio and Hypertension Across Acute Coronary Syndrome Subtypes: Insights From a Peripheral Hospital Cohort

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Absract

Background : Inflammation plays a central role in the pathophysiology of acute coronary syndrome (ACS), and the neutrophil-to-lymphocyte ratio (NLR) has emerged as a simple inflammatory marker associated with disease severity and outcomes. Hypertension, a major cardiovascular risk factor, is closely linked to chronic low-grade inflammation, this study evaluating the interaction between hypertension, NLR, and ACS subtypes in peripheral hospital RSUD Pameungpeuk.

Objective : To assess differences in NLR across ACS subtypes according to hypertension status in a peripheral hospital cohort.

Methods : This retrospective cohort study included consecutive patients admitted with confirmed ACS unstable angina pectoris (UAP), non-ST-segment elevation myocardial infarction (NSTEMI), or ST-segment elevation myocardial infarction (STEMI) between January and December 2025. Blood pressure at admission was classified using JNC 7 criteria and dichotomized into normotensive (<140/90 mmHg) and hypertensive (\geq 140/90 mmHg) groups. NLR was calculated from admission complete blood counts and compared across ACS subtypes and blood pressure status.

Results : Among 135 patients (mean age 58.6 years; 62.4% male), NSTEMI was the most frequent presentation (56.1%). Hypertension

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was present in 55.6% of patients. NLR increased with ACS severity. Hypertensive patients with STEMI demonstrated the highest mean NLR compared with normotensive STEMI patients (6.97 vs. 4.77). In NSTEMI and UAP, NLR values were lower and showed less pronounced differences between blood pressure categories.

Conclusion : NLR varies according to ACS subtype and hypertension status, with the greatest inflammatory burden observed in hypertensive STEMI patients. NLR may serve as a practical inflammatory marker for early risk stratification in resource-limited settings.

Keywords: acute coronary syndrome; neutrophil-to-lymphocyte ratio; hypertension

MP-019

Personalizing Cognitive Risk Screening by Hypertension Severity: A Community Health Initiative for Preventing Cerebrovascular Complications

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Background: Hypertension increases risk for cognitive impairment and cerebrovascular complications. Whether cognitive impairment increases progressively with hypertension severity remains incompletely characterized in diverse populations. Early identification through accessible screening tools in community health programs enables personalized prevention strategies.

Objective: To evaluate the prevalence of cognitive impairment across hypertension severity categories and assess dose-response association for clinical and public health decision-making.

Methods: Cross-sectional analysis of 190 prospective Hajj pilgrims aged ≥ 50 years at UPTD Puskesmas Pancoran Mas (October–December

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2025). Blood pressure was classified per 2025 AHA/ACC guidelines. Cognitive function was assessed using Mini-Cog (<3 indicating impairment) with supplementary Clock Drawing Test. Proportions were compared using chi-square tests; odds ratios (OR) with 95% confidence intervals (CI) were calculated.

Results: Among 190 participants (mean age 59.6±7.2 years; 59.5% female), 113 (59.5%) had hypertension (57 Stage 1, 56 Stage 2). Overall, 26 (13.7%) demonstrated cognitive impairment. A significant dose-response relationship was observed: cognitive impairment prevalence was 7.0% in Stage 1, 25.0% in Stage 2, and 10.4% in non-hypertensive individuals ($\chi^2=5.54$, $p=0.019$; 3.6-fold difference). Abnormal Clock Drawing Test findings were significantly more prevalent in hypertensive group (44.2% vs. 28.6%; OR=1.98, 95% CI: 1.07–3.68; $p=0.042$).

Conclusion: Higher cognitive impairment demonstrated significant dose-response relationship with hypertension severity. These findings support implementing rapid, accessible cognitive screening (Mini-Cog with Clock Drawing Test) in community health programs. A personalized, risk-stratified screening approach enables health workers to identify and target high-risk individuals, empowering communities to prevent cerebrovascular complications.

Keywords: Hypertension, Cognitive impairment, Risk stratification, Community health screening, Personalized prevention

MP-020

Silencing Angiotensinogen (AGT): *In Silico* Development of A Potent Small Interfering RNA (siRNA)-Based Therapy Candidate for Hypertension Treatment

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Background: Hypertension is a major modifiable risk factor for cardiovascular morbidity and mortality with 69 drugs across 15 classes approved. Nevertheless, resistant hypertension often requires ≥ 4 medications, reducing adherence. Emerging evidence highlights siRNA, such as Zilebesiran, as promising alternatives. However, a number of potential candidates remain unexplored.

Objective: This study aimed to identify and evaluate siRNA candidates targeting AGT using multiple *In Silico* approaches.

Method: Angiotensinogen coding DNA sequences were retrieved from NCBI. siRNA candidates were predicted in SiDirect 2.1 using The Ui-Tei, Reynolds, and Amarzguoui algorithms, with cross-validation performed using SiExplorer and Oligowalk. GC content, palindromic sequences, off-target analysis, and target accessibility were assessed using OligoCalc, BLAST, and Sfold, respectively. Selected siRNAs underwent structural and thermodynamics analyses. The human Ago2 protein was obtained from RCSB PDB, modeled with SWISS-MODEL, refined using GalaxyRefine, and docked with siRNA using HDock.

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Result: Homo sapiens AGT (NM_001382817.3) comprising 2,148 mRNA nucleotides was retrieved from NCBI. Twenty-three siRNAs were predicted, with seven passing cross-validation, and siRNA4 emerged as the only candidate with 33% GC content, target accessibility score of 13, absence of palindromic sequence, and no significant off-target effects. siRNA4 structural and thermodynamics analysis exhibited favorable results. The refined human Ago2 demonstrated good quality (z-score -14.42, ERRAT score 92.355, 95.6% favored residues). Molecular docking presented strong siRNA4-Ago2 interaction (docking score -340,29, confidence score 0.978) involving PAZ and MID domain hydrogen bonds.

Conclusion: siRNA4 is a promising antihypertensive candidate targeting angiotensinogen and prospective for further experimental validation.

MP-021

Hypertension-Associated Renal Molecular Signatures in Deceased Donor Kidneys: Transcriptomic and Network-Based Identification

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ABSTRACT

Background: Donor hypertension is a common risk factor in kidney transplantation; however, histological assessment alone does not fully explain variability in post-transplant graft function. Molecular characterization of hypertensive donor kidneys may provide additional insights into donor-related graft risk.

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Objectives: To identify hypertension-associated renal molecular signatures in deceased donor kidneys and explore their potential clinical implications for kidney transplant recipients.

Methods: We performed a transcriptomic analysis of kidney procurement biopsies from the Gene Expression Omnibus dataset GSE290167, derived from a prospective single-center study (NCT06171438). A total of 276 kidneys from 174 deceased donors were analyzed, including 97 donors with a documented clinical history of hypertension and 179 without hypertension. Gene expression profiling was conducted using Affymetrix microarrays. Differentially expressed genes (DEGs) were identified between hypertensive and non-hypertensive donors. After deduplication and exclusion of immunoglobulin-related transcripts, 31 upregulated hypertension-associated genes were selected for downstream analyses. Functional enrichment was assessed using Gene Ontology and KEGG pathway analysis. Protein-protein interaction (PPI) networks were constructed, hub genes were identified using CytoHubba, and functional modules were explored using K-means clustering.

Results: Hypertensive donor kidneys demonstrated enrichment of pathways related to platelet activation, extracellular matrix-receptor interaction, chemokine and cytokine signaling, and PI3K-Akt signaling (adjusted $p < 0.05$), alongside biological processes involving growth factor response, protein kinase B signaling, and vascular morphogenesis. PPI analysis revealed a sparse but biologically relevant network. CytoHubba identified CX3CR1 as the most central hub gene, with additional key nodes including ITGB3, IRF8, TLR7, and F3. K-means clustering further delineated an inflammatory-vascular interaction module as the dominant cluster, accompanied by smaller modules related to tissue remodeling and signaling regulation.

Conclusion: Donor hypertension is associated with distinct renal molecular signatures dominated by inflammatory and vascular signaling. These findings highlight molecular heterogeneity beyond histology and support the potential role of transcriptomic profiling in improving donor kidney risk stratification for transplantation.

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Keywords: Hypertension; Kidney Transplantation; Transcriptomic Profiling; PPI Network; Donor Risk Stratification

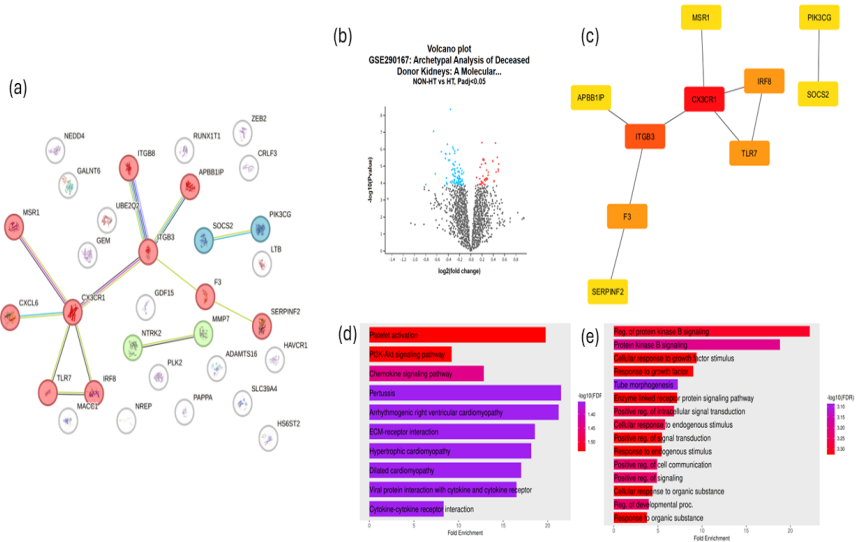


FIGURE 1. (a) Protein-Protein Interaction of Upregulated Genes (b) Volcano Plot of DEGs (c) Cytohubba ranks based on algorithms (d) Gene Ontology Biological Process (e) Predicted KEGG Pathways

Table 1. Summary of Mendelian Randomization of Uromodulin and Hypertension Association

Reference	Number of SNPs (IVs)	Exposure Data Source	Outcome(s)	MR Analysis	Effect Size (OR/ β) and p-value
You et al., 2021	2 SNPs (rs12917707, rs4494548)	Urinary Uromodulin (uUMOD)	Hypertension, SBP, DBP	IVW, MR-Egger, Weighted Median, MR-PRESSO	OR = 1.036 (Hypertension, $p < 0.001$) SBP: $\beta = 1.10$, DBP: $\beta = 0.88$, $p < 0.001$
Jian et al., 2022	Multiple SNPs	Urinary Uromodulin	Myocardial Infarction, Mediated by BP	Bidirectional MR, Multivariable MR	OR = 1.08 (MI, $p = 0.009$), 69% mediation by SBP, 87% by DBP
Sjaarda et al., 2020	16 SNPs (after LD pruning)	Serum Uromodulin (sUMOD)	SBP, DBP, Hypertension	IVW, MR-Egger, Weighted Median	SBP: $\beta = 0.371$, DBP: $\beta = 0.313$, Hypertension OR = 1.013 ($p < 0.001$)

MP-022

Microplastic-Induced Systemic Hypertension: A Bioinformatic Characterization of the Multi-Tissue Hepatic-Dermal-Vascular Inflammatory Axis

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Background: Environmental exposure to microplastics (MPs) is increasingly linked to systemic disease, including metabolic syndrome, respiratory disorders, and cardiovascular dysfunction. However, the molecular mechanisms that connect localized MP deposition in peripheral organs to the development of hypertension remain poorly defined, and few studies have explored the cross-organ inflammatory signaling that may drive vascular injury.

Objective: We applied a bioinformatic pipeline to determine how plastic-related compounds in skin, lung, and liver converge on inflammatory pathways that promote endothelial dysfunction.

Methods: Transcriptomic datasets (GSE255709, GSE237739, GSE269348) from MP-exposed skin, lung, and liver were processed (adjusted $p < 0.05$, $|\log_2FC| > 1$). Venn analysis identified convergent DEGs, which were entered into STRING for protein-protein interaction network construction. Highly interconnected modules were extracted with MCODE, and functional and disease enrichment were performed using Enrichr.

Results: Two major modules emerged. An interferon-stimulated gene cluster (34 genes; MCODE score 33.0) dominated by STAT1, ISG15, MX1 and enriched for viral-like sterile inflammation ($P = 1.59 \times 10^{-16}$) and low-HDL metabolism ($P = 1.19 \times 10^{-4}$). (ii) A TNF/AP-1 module (22 genes; MCODE score 16.0) centered on TNF, FOS, JUN, enriched for psoriasis vulgaris ($P = 9.26 \times 10^{-10}$) and the TNF-signaling pathway ($P = 2.11 \times 10^{-17}$); endothelial injury markers ICAM1, IL6, PTGS2 showed

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high centrality. Intersection of the three tissue-specific DEG lists revealed only two universal bottleneck genes: IRF1 (up-regulated) and GREB1 (down-regulated), indicating systemic innate activation and loss of estrogen-mediated vasoprotection.

Conclusion: These findings support a two-hit model of MP-induced hypertension, wherein interferon-driven inflammation initiates vascular stress and TNF-mediated signaling sustains endothelial dysfunction within a hepatic-dermal-vascular axis. IRF1 and GREB1 constitute concise biomarkers and provide a framework that deliberately invites deeper mechanistic investigation and therapeutic development.

Keywords: Microplastic; Hypertension; TNF-signaling; endothelial dysfunction.

MP-023

Gene Identification in Hypertensive Disorders of Pregnancy: Evidence from Bioinformatics Analysis of Transcriptomic Profiles in Gestational Hypertension and Preeclampsia

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Introduction. Hypertensive disorders of pregnancy (HDP), such as gestational hypertension and preeclampsia, significantly increase risks of maternal morbidity, mortality, and long-term cardiovascular disease. These conditions arise when normal physiologic blood pressure adjustments are replaced by pathophysiologic alterations, requiring a deeper understanding of their underlying mechanisms. Consequently, this study employs comparative transcriptomic profiling to analyze the

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mechanisms of these disorders by identifying distinct and overlapping gene expression patterns.

Methods. Two high-throughput sequencing (RNA-seq) datasets (GSE306864 and GSE255075) were obtained from the Gene Expression Omnibus (GEO) database. R-software was used to analyze differentially expressed genes (DEGs) using the DESeq package. The screening criteria were an adjP-value <0.05 and logFC (fold change) >1 . Common DEGs across the datasets were analyzed for functional enrichment and pathways using the WebGestalt platform to identify biological, cellular, and molecular processes.

Results. Through an intersection analysis of two independent datasets, we identified CP and QPCT as shared genes that may play a role in the pathogenesis of HDP. Functional enrichment analysis of DEGs across the datasets revealed significant associations, including fibronectin binding at the molecular level, desmosome at the cellular component level, and multicellular organism processes at the biological process level.

Conclusion. This comparative transcriptomic profiling identified two overlapping genes (CP and QPCT) that drive the mechanisms of HDP. These results provide a foundation for future research into targeted diagnostics and confirm a conserved genetic link between the two conditions.

Keywords: Bioinformatics; preeclampsia; gestational hypertension; hypertensive disorders of pregnancy.

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MP-024

Residual Urine Volume and Blood Pressure Control in Peritoneal Dialysis Patients at a Tertiary Referral Center in Indonesia

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Background: Residual kidney function, commonly reflected by residual urine volume, is associated with improved survival and better blood pressure (BP) control in end-stage kidney disease patients. Preserving residual urine output may therefore be important for optimizing BP management among patients undergoing peritoneal dialysis (PD). This study aimed to evaluate the association between residual urine volume and systolic blood pressure (SBP) control in PD patients.

Methods: A cross-sectional study was conducted from 1 January 2024 to 31 December 2025. Adult PD patients (>18 years) undergoing PD for at least three months were included. Patients with active infection or severe comorbid conditions were excluded. The association of SBP and residual urine volume was assessed using Spearman correlation.

Result: A total of 65 patients were included. The mean age was 44.9±13.9 years, with a PD duration of 18 (8-40) month, the mean SBP was 145.7±22.5 mmHg, and daily urine volume was 100 (IQR 0-500) mL. Residual urine volume showed a statistically significant inverse correlation with SBP ($r = -0.258$, $p = 0.038$). In multivariable linear regression model, higher residual urine volume remained associated with lower SBP although statistically not significant ($\beta = -0.015$ mmHg per 1 mL increase; 95% CI -0.032 to 0.003 ; $p = 0.096$). The

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model demonstrated modest explanatory power ($R^2=0.247$; adjusted $R^2=0.055$).

Conclusion: Residual urine volume showed a weak inverse correlation with SBP in PD patients, but this relationship was attenuated and no longer significant after adjustment, suggesting that residual urine alone may not independently explain SBP variability in this population.

Keyword: *residual urine volume, systolic blood pressure, peritoneal dialysis patients*

Tabel 1. Baseline characteristics

Variabel	N=65
Age (year)	44.94 (SD 13.89)
Sex, n (%)	
Men	32 (49.2)
Female	33 (50.8)
BMI, kg/m ²	23.9 (20.8-27.5)
SBP, mmHg	145.65 (SD 22.50)
DBP, mmHg	89.45 (SD 13.82)
Hemoglobin, g/dl	9.09 (SD 1.48)
Potassium, mmol/L	3.95 (SD 0.77)
Albumin, g/dL	3.6 (SD 0.45)
Duration of PD, Median (IQR)	18 (8-40)
Urine volume, Median (IQR)	100 (0-500)
Number of antihypertensive drugs	2.32 (SD 1.11)
CCB, n (%)	
Yes	53 (81.5)
No	12 (18.5)
ACEI/ARB, n (%)	
Yes	51 (78.5)
No	14 (21.5)
MRA, n (%)	
Yes	10 (15.4)

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No	55 (84.6)
Diuretic, n (%)	
Yes	1 (1.5)
No	64 (98.5)

Table 2. Correlation between residual urine volume and SBP

Variabel	r	p
SBP-Urine volume	-0.258	0.038

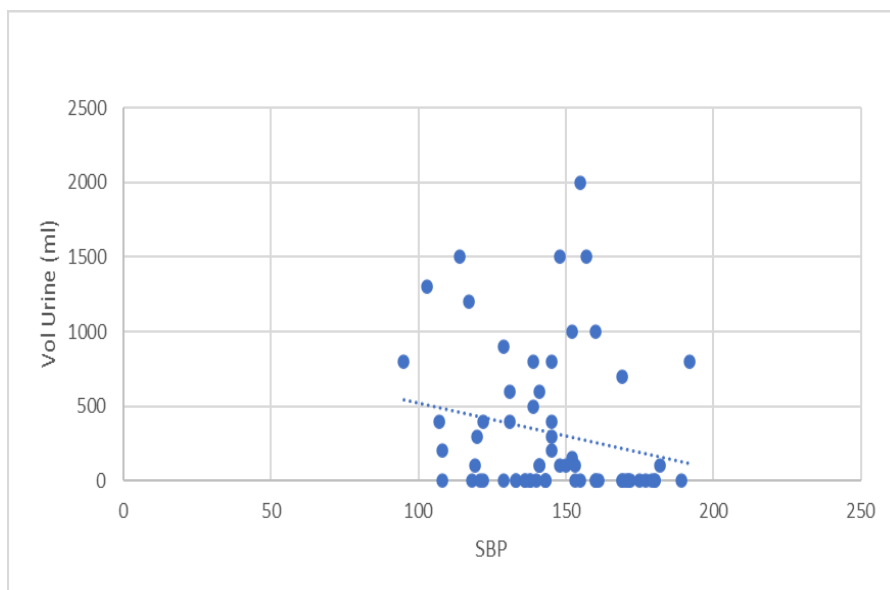


Table 3. Multivariable analysis: factors associated with SBP

Model fit: n = 65; R² = 0.247; adjusted R² = 0.055; AIC = 626.3.

Variable	Beta (95% CI)	p-value
Intercept	105.051 (14.418 to 195.684)	0.0240
Residual urine volume (per 1 mL)	-0.015 (-0.032 to 0.003)	0.0957

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Variable	Beta (95% CI)	p-value
Age (per 1 year)	0.449 (-0.083 to 0.981)	0.0962
Female sex (vs male)	-8.521 (-23.541 to 6.498)	0.2600
BMI (per 1 kg/m ²)	-0.282 (-0.829 to 0.265)	0.3060
Hemoglobin (per 1 g/dL)	0.319 (-4.843 to 5.481)	0.9020
Albumin (per 1 g/dL)	12.282 (-4.395 to 28.959)	0.1450
Potassium (per 1 mmol/L)	-4.927 (-14.113 to 4.260)	0.2870
Number of antihypertensive drugs (per 1 drug)	-4.561 (-23.274 to 14.152)	0.6270
ACEI/ARB use (yes vs no)	12.680 (-15.237 to 40.597)	0.3660
CCB use (yes vs no)	1.021 (-28.410 to 30.453)	0.9450
Beta-blocker use (yes vs no)	13.281 (-9.600 to 36.161)	0.2490
MRA use (yes vs no)	3.932 (-19.501 to 27.364)	0.7380
Diuretic use (yes vs no)	15.306 (-48.313 to 78.924)	0.6310

MP-025

Admission Systolic Blood Pressure as a Continuous Hemodynamic Marker of In-Hospital Mortality in Acute Coronary Syndrome (ACS): Preliminary Results from the TRACE Registry

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Background: ESC 2024 guideline highlights that blood-pressure-related cardiovascular risk is continuous rather than an ordinal scale (using hypertension grading). Using prospective cohort data from TRACE (Tobelo Registry of Acute Coronary Events), a registry from

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Tobelo Regional Hospital, North Halmahera, North Maluku, we assessed whether admission systolic blood pressure (SBP) aligns with in-hospital outcomes in ACS.

Methods: From July to December 2025, we analyzed 66 consecutive admissions to the emergency room from ACS. The patients were followed up until discharged. Admission SBP is reported as median with interquartile range (IQR). Group differences were tested using Mann-Whitney or Kruskal-Wallis tests, as appropriate (two-sided $p < 0.05$). The primary outcome was in-hospital mortality. The secondary outcomes were demographic, laboratory, and echocardiographic findings.

Results: Lower admission SBP was associated with in-hospital mortality ($n=5/66$; 7.6%) (non-survivors: SBP of 97 [69.5–125] vs survivors: SBP 130 [110–149] mmHg; $p=0.031$). Admission SBP also varied systematically across patient characteristics, with higher values observed in females compared with males (SBP of 140 [120.5–163] vs 123 [99.5–140] mmHg; $p=0.018$) and in patients with concentric left ventricular hypertrophy (SBP of 134 [125–169] vs 123 [100–143] mmHg; $p=0.029$). In contrast, thrombocytopenia was associated with lower SBP (SBP of 106 [80–120] vs 130 [111–146.5] mmHg; $p=0.005$).

Conclusions: In this preliminary analysis, admission SBP below approximately 100 mmHg was associated with increased in-hospital mortality (97 mmHg in non-survivors vs 130 mmHg in survivors; $p=0.031$). Admission SBP also varied by patient characteristics, with higher values observed in females and those with concentric LV hypertrophy, and lower values in patients with thrombocytopenia, supporting SBP as a numeric, context-dependent hemodynamic marker in ACS.

Keywords: *Systolic blood pressure; Acute coronary syndrome; In-hospital outcomes; Mortality.*

MP-026

Young Adults with Hypertension in Indonesia and Associated Factors: Insights from the POSBINDU PTM Registry

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Background: Hypertension is a major risk factor for cardiovascular disease. Recent evidence suggests a shift in the onset of hypertension toward younger populations. We aimed to describe the prevalence, demographic characteristics, and factors associated with hypertension among young adults in Indonesia.

Methods: This cross-sectional study used data from the Integrated Community Health Post for early detection, monitoring, and prevention of NCDs (POSBINDU PTM) registry, including 1,782,365 participants across Indonesia from 2014 to 2017. After excluding incomplete records and outliers, 232,638 participants aged ≥ 18 years were included. Of these, 87,785 young adults aged 18–39 years were analysed. Hypertension was defined as SBP ≥ 140 mmHg or DBP ≥ 90 mmHg during a POSBINDU visit. Multivariate logistic regression was performed to identify the factors independently associated with hypertension.

Results: Among the young adults, 14,088 individuals (16.04%) had hypertension. Most of the participants were female (71.6%). All assessed characteristics were significantly associated with hypertension ($p \leq 0.05$), except for low physical activity. In multivariate analysis, the strongest association was family history of hypertension (adjusted

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odds ratio [aOR] 14.95; 95% confidence interval [CI] 14.05–15.92). Male sex, central obesity, increasing age, smoking, alcohol consumption, higher BMI categories, and higher work intensity were independently associated with hypertension, whereas higher education was inversely associated.

Conclusion: Approximately one in six young adults in Indonesia has hypertension, with family history showing the strongest association. Early identification and prevention strategies targeting high-risk young adults may reduce the future burden of cardiovascular disease.

Keywords: *Hypertension; Young Adults; Indonesia; Family History; POSBINDU PTM.*

MP-027

Integrated Bioinformatics Analysis on the Mechanism of Gestational Hypertension in Preeclampsia Patients

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Background: Preeclampsia is a pregnancy-specific hypertensive disorder that encompasses 2–8% of its complications and is responsible for more than 50,000 maternal and 500,000 fetal deaths worldwide. Although trophoblast invasion is recognized as a contributor to disease pathogenesis, the molecular pathways linking it with hypertensive preeclampsia remains incompletely understood.

Objective: To identify whole-blood gene expression signatures and key molecular pathways associated with hypertension mechanisms in preeclampsia.

Method: Whole-blood transcriptomic data were obtained from the Gene

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Expression Omnibus (GEO) dataset GSE48424, including normotensive, non-severe and severe preeclampsia pregnant women. Differentially expressed genes (DEGs) were identified using GEO2R. Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway enrichment were performed for the DEGs. Protein-protein interaction (PPI) networks were constructed using STRING and Cytoscape, and hub genes were identified with the cytoHubba plugin.

Result: A total of 38 upregulated and 114 downregulated genes in hypertensive preeclampsia were identified. Upregulated genes were enriched for GO terms related to cytoskeletal remodeling, ruffle assembly, and glutathione transferase activity. In contrast, downregulated genes were enriched for response to lipopolysaccharides, specific granules, and CXCR chemokine receptor binding, suggesting cell migration and altered signaling associated with hypertension severity. KEGG showed relation in pathways involving glutathione metabolism in upregulated genes, and arachidonic acid metabolism in downregulated genes. PPI network analysis identified 6 hubgenes.

Conclusion: Hypertensive preeclampsia is marked by cell migration, heightened oxidative stress responses, and impaired vascular regulation. These findings allow for deeper understanding of the known pathogenesis of gestational hypertension in preeclampsia.

Keyword: *Bioinformatics; DEGs; Gestational hypertension; Preeclampsia; Molecular pathways*

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MP-028

Myocardial Work Across Left Ventricular Geometric Patterns in Stroke Patients with Hypertensive Heart Disease

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Background: Myocardial work (MW) is a novel set of dynamic non-invasive parameters that involves afterload and overcomes the dependency on left ventricular ejection fraction (LVEF) and LV strain. Stroke patients with hypertensive heart disease (HHD) are a high-risk population that often exhibits changes in LV geometry.

Objective: To evaluate MW in stroke patients with HHD who present with different LV geometric patterns.

Methods: This cross-sectional descriptive study included 33 stroke patients with HHD at Dr.M.Djamil Hospital. Patients were categorized into eccentric hypertrophy, concentric remodeling, and concentric hypertrophy. MW was assessed using 2D speckle-tracking echocardiography, measuring global work index (GWI), global constructive work (GCW), global wasted work (GWW), and global work efficiency (GWE). Statistical analyses compared MW parameters and standard cardiac function measures among the three groups.

Results: In this study 93.9% (n=31) had ischemic stroke, and 6.1% (n=2) had hemorrhagic stroke with overall EF is $52.85 \pm 8.18\%$. The majority of patients (75.8%, n=25) had concentric hypertrophy, concentric remodeling (15.2%, n=5), and eccentric hypertrophy (9.1%, n=3). When comparing MW parameters among the three LV geometry groups,

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no significant differences in GWI ($p=0.526$), GCW ($p=0.627$), GWW ($p=0.817$), or GWE ($p=0.663$).

Conclusion: There is no significant differences in MW parameters among stroke patients with different LV geometries. Theoretically, increasingly abnormal LV geometry, associated with reduced GCW and GWI, increased GWW, and consequently lower GWE, reflecting impaired myocardial mechanical efficiency despite preserved LVEF. Larger studies are needed to validate MW as an early detector of myocardial deformation.

Keywords: Myocardial Work; Hypertensive Heart Disease; Stroke; Left Ventricular Geometry

Table 1. Demographic Characteristics

	Group			P value
	Eccentric hypertrophy (n=3)	Concentric remodelling (n=5)	Concentric hypertrophic (n=25)	
Age (years) ^a	61.67 ± 6.66	50.60 ± 20.72	59.12 ± 15.99	0.528
Sex, n (%) ^c				
Male	1 (33%)	4 (80%)	15 (60%)	0.422
Female	2 (66.7%)	1 (20%)	10 (40%)	
SBP (mmHg) ^a	133.67 ± 23.07	142.20 ± 14.70	135.40 ± 15.92	0.672
DBP (mmHg) ^b	70 ± 12.50	79 ± 12.99	80 ± 7.77	0.489
HR (bpm) ^a	78.33 ± 10.60	90 ± 17.44	72.72 ± 17.17	0.125
BSA (m ²) ^b	1.76 ± 0.24	1.87 ± 0.28	1.62 ± 0.19	0.019
Type of Stroke ^c				
Infark	3 (100%)	5 (100%)	23 (92%)	0.711
Hemorragik	0	0	2 (8%)	
LVEDD (mm) ^a	57.67 ± 7.02	43.40 ± 4.72	44.28 ± 8.36	0.028
IVSd (mm) ^a	11.33 ± 3.79	11.40 ± 4.16	13.08 ± 2.40	0.339
PWd (mm) ^b	10 ± 2.08	10 ± 1.30	13 ± 1.96	0.022
RWT ^a	0.33 ± 0.10	0.50 ± 0.09	0.59 ± 0.17	0.036
LVMI (g/m ²) ^b	130 ± 15.31	73 ± 29.08	129 ± 37.60	0.050
LAVI (ml/m ²) ^a	40.67 ± 35.85	20.60 ± 11.08	29.64 ± 13.21	0.221
TAPSE (cm) ^b	1.70 ± 0.35	2.00 ± 0.41	2.20 ± 0.39	0.090

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EF Biplane (%) ^b	43 ± 11.24	57 ± 2.49	57 ± 7.93	0.400
EF (%) ^b	38 ± 14.43	51 ± 6.83	55 ± 7.36	0.166
2 CH (%) ^a	-12.00 ± 9.88	-12.66 ± 4.35	-14.26 ± 3.86	0.602
4 CH (%) ^a	-12.40 ± 5.90	-13.78 ± 4.60	-14.13 ± 3.69	0.778
APLAX (%) ^b	-6.30 ± 9.37	-14.40 ± 4.63	-14.90 ± 7.28	0.678
AVG (%) ^a	-11.63 ± 8.14	-13.48 ± 3.77	-14.31 ± 3.35	0.520
PSD FULL ^b	76.10 ± 25.63	92.20 ± 35.53	76.50 ± 44.34	0.209

Data normality was tested using the Shapiro-Wilk test :

^a Data analysed using Oneway Anova Test

^b Data analysed using Kruskal Wallis Test

^c Data analysed using Chi-Square Test

* p<0.05 (statistically significant)

Tabel 2. Myocardial work

	Group			<i>P value</i>
	Eccentric hypertrophy (n=3)	Concentric remodelling (n=5)	Concentric hypertropic (n=25)	
Global Work Index (mmHg%) ^a	631 ± 1233.89	1321 ± 468.93	1507 ± 432.28	0.526
Global Constructive Work(mmHg%) ^a	981 ± 1320.29	1836 ± 376.58	1812 ± 430.02	0.627
Global Waste work (mmHg%) ^a	232 ± 135.71	240 ± 84.78	225 ± 173.50	0.817
Global Work Efficiency (%) ^a	80 ± 13.01	88 ± 5.52	90 ± 8.05	0.663

Data normality was tested using the Shapiro-Wilk test :

^a Data analysed using Kruskal Wallis Test

* p<0.05 (statistically significant)

MP-029

Clock Drawing Test Error Patterns in Hypertensive Older Adults in Primary Care: A Community-Based Screening Study**Hanida Rahmah¹, Triandra Suparno²***¹Puskesmas Ratu Jaya, Depok, Indonesia; ²Puskesmas Pancoran Mas, Depok, Indonesia*

Background : Hypertension is the leading modifiable risk factor for cardio-cerebrovascular disease. Rapid screening tools for detecting hypertension-related cognitive impairment remain underutilized in resource-limited primary care settings. The Clock Drawing Test (CDT) is a rapid, cost-free screening instrument, ideal for community health centers to personalize risk assessment in older adults.

Objective : To assess CDT screening yield for possible cognitive impairment among hypertensive adults in primary care.

Methods : Cross-sectional study of 190 adults ≥ 50 years (115 with Stage 1-2 hypertension, 75 controls) at Puskesmas Pancoran Mas, Indonesia (October-November 2025). Blood pressure classified per AHA 2025 guidelines; uncontrolled hypertension defined as BP $\geq 140/90$ mmHg on therapy. Cognitive function assessed via Mini-Cog with CDT (score 0-5). Analysis included t-tests, chi-square tests, and Poisson regression for prevalence ratios.

Results : CDT errors were significantly more prevalent in hypertensive versus non-hypertensive participants (58.3% vs 37.3%; PR 1.56, 95% CI 1.12-2.17; $p=0.003$) with lower mean CDT scores in hypertensive group (3.15 ± 1.42 vs 4.02 ± 1.12 ; $p < 0.001$). Uncontrolled hypertension was associated with hand-placement errors ($p=0.02$). The CDT screen-positive rate (score $\leq 3/5$) was 72% (83/115) in Hypertensive participants.

Conclusions : Hypertension, particularly uncontrolled blood pressure, was associated with specific CDT error patterns in this cross-sectional

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primary care sample. CDT may help support risk stratification and prioritize older adults for closer monitoring and further cognitive evaluation.

Keywords : Clock Drawing Test; hypertension; cognitive screening; cerebrovascular disease

MP-030

Family Empowerment as a Caregiver Strategy in Hypertension Management: Lessons from the Cek Kesehatan Gratis Program in Indonesia

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Background: Hypertension is a major, yet often undiagnosed, risk factor for cardio-cerebro-renal complications in Indonesia. The Cek Kesehatan Gratis (CKG) program, launched in 2025, provides nationwide screenings via primary healthcare facilities, facilitating large-scale intervention.

Objective: This study explores the need for interventions extending beyond clinic-based care to include family and community support. It highlights the role of empowering families as primary caregivers

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in managing hypertension, a responsibility typically associated with terminal illnesses, promoting behavioral change and adherence.

Methods: A mixed-methods study using CKG data, supplemented by informant interviews with healthcare workers and District Health Office representatives. Quantitative data identified demographic patterns and prevalence, while qualitative analysis explored caregiver roles, engagement barriers, and opportunities for integration into community.

Results: CKG data from the Ministry of Health of the Republic of Indonesia, covering 34,628,677 adults, revealed a hypertension prevalence of 18.13%, with increased blood pressure observed in younger adults and nearly 50% prevalence among older adults. Prehypertension affected 12.18% (4.2 million). Qualitative findings highlighted the importance of caregiver and community involvement, particularly family, health cadres, and home-based outreach, in improving patient engagement and adherence.

Conclusion: Reframing caregiving from end-stage assistance to lifelong chronic disease support may strengthen hypertension control. Empowering families as caregivers provides a culturally suitable and scalable strategy to enhance hypertension prevention and control. The CKG program, supported by Puskesmas, offers a significant opportunity to integrate caregiver support into routine care. Further study with more rigorous sampling of interview respondents is needed to explore cultural context and best practices.

Keywords: hypertension; cek kesehatan gratis; family empowerment; caregiver; older adults

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MP-031

Hypertension Remains a Major Public Health Burden in Indonesia: Evidence from the Cek Kesehatan Gratis Program

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Background: Hypertension is a key modifiable risk factor for cardiovascular and neurological diseases in Indonesia but remains largely underdiagnosed. The Cek Kesehatan Gratis (CKG) program, launched in 2025, offers free blood pressure screenings through primary healthcare facilities, providing an opportunity to quickly assess hypertension prevalence and implement early management, in line with the HOPE Asia framework.

Objective: This preliminary study aims to determine the prevalence of hypertension identified through CKG and assess how the program supports HOPE Asia's principles of early detection and management.

Methods: A mixed-methods observational study was conducted using national CKG data to estimate hypertension prevalence across adult age groups. Key informant interviews with healthcare providers and

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District Health Office representatives from urban and rural areas were conducted to gain qualitative insights, guided by HOPE Asia's action approaches focusing on screening coverage, diagnostic confirmation, and treatment linkage.

Results: Data from 34,628,677 adults from February-December 2025 revealed a hypertension prevalence of 18.13%, with significant increases in older adults, especially those ≥ 60 years, where the prevalence approached 50%. Prehypertension affected 12.18%. Interviews highlighted that CKG improved early detection and management but continuity of care is compromised by asymptomatic perceptions, mobility constraints, limited health literacy, and systemic barriers such as administrative workload, uneven digital capacity, lack of workshops, and geographic challenges.

Conclusion: CKG confirms high hypertension prevalence in Indonesia, emphasizing the need for early detection. The program aligns with HOPE Asia's approach by reducing diagnostic delays and promoting timely treatment, laying a foundation for reducing cardia-cerebro-renal complications in Indonesia.

Keywords: hypertension; cek kesehatan gratis; lessons learned; barriers; older adults

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MP-032

EFFICACY AND SAFETY OF NON INVASIVE VAGAL NEUROMODULATION USING TRANSCUTANEOUS VAGUS NERVE STIMULATION (tVNS) IN REDUCING INFLAMMATION IN HYPERTENSIVE HEART FAILURE PATIENTS WITH PRESERVED AND MILDLY REDUCED EJECTION FRACTION: A META ANALYSIS AND SYSTEMATIC REVIEW

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Abstract

Background: Heart failure with preserved (HFpEF) and mildly reduced ejection fraction (HFmrEF) are the most common conditions caused by prolonged hypertension. Despite rising prevalence, effective treatments remain limited. Transcutaneous vagus nerve stimulation (tVNS) has emerged as a non-invasive therapy to modulate autonomic tone and reduce inflammation, proving effective in multiple studies.

Objective: This study serves to systematically analyze the efficacy and safety of tVNS in hypertensive HFpEF and HFmrEF patients.

Method: A search from PubMed, Science Direct, Scopus, EBSCO, Cochrane, Wiley, Springer, and Google Scholar about HFpEF and HFmrEF population receiving tVNS was conducted following PRISMA guidelines. Primary parameters included global longitudinal strain (GLS), E/e' ratio, and left ventricle ejection fraction (LVEF). Analysis was performed using Revman 5.4 and RoB 2.0 tool to assess risk of bias.

Results: Three studies were included in the analysis. GLS results (-2.20 [-3.27, -1.13]) showed a significant improvement in the intervention group, suggesting enhanced longitudinal systolic function. This may indicate that tVNS inhibits pro-inflammatory cytokines and activates vagal anti-inflammatory pathways. However, the E/e' ratio (-0.04

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[-0.80, 0.72]) showed no significant change, indicating tVNS does not alter LV filling pressure. LVEF results (-0.08 [-2.70, 2.53]) confirmed that tVNS does not worsen normal ejection fraction. The selected studies demonstrated low bias and low heterogeneity ($I^2 = 0\%$, $P > 0.10$).

Conclusion: tVNS reduces inflammation in heart failure without impairing normal EF. Evidence is limited by small sample sizes and variable intervention duration, highlighting the need for larger, standardized trials.

Keywords: GLS, HFpEF, HFmrEF, inflammation, tVNS.

MP-033

Association Between Hypertension-Related Knowledge, Dietary Salt Reduction Adherence, and Staging of Hypertension Among Hypertensive Patients in Medan, North Sumatera

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Background: Numerous studies indicate that patients with higher knowledge about hypertension are significantly more likely to adhere to a low-salt diet and engage in lifestyle modifications. Consequently, they are effectively managing blood pressure and preventing its serious complications. However, a limited number of studies have evaluated patients' knowledge about hypertension, adherence to Dietary Salt Reduction, and blood pressure (BP) control.

Objective: to assess the extent of knowledge about hypertension, Dietary Salt Reduction adherence, and its Association with staging of hypertension among adult hypertensive patients in Medan, North Sumatera.

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Method: This cross-sectional observational study included 97 hypertensive outpatients at Universitas Sumatera Utara Hospital and H. Adam Malik Central General Hospital. The Hypertension Fact Questionnaire and the Dietary Salt Reduction Self-Care Behavior Scale were used to measure hypertension knowledge, and obtained self-reports on dietary Salt Reduction adherence.

Result: Overall, the mean age of study participants was 56.4 ± 2.7 years, 72.2 % were women. The majority had greater than a high school education (58.7 %) with high knowledge of hypertension (83.5%). More than 90% of respondents correctly specified normal blood pressure as readings 120/80mmHg. At least 90% of participants correctly answered the questions about the role of healthy lifestyle modifications in lowering BP including dietary salt reduction, consumption of fruits and vegetables, and losing weight. 51.5% of the study participants reported adherence to reducing salt in their diet. Although not statistically significant, we found that patients with high knowledge of hypertension were more likely to reduce salt in their diet ($p=0.417$). However, this study consistently shows a significant association between Dietary Salt Reduction adherence with good BP control ($p<0,001$).

Conclusion: Intensifying educational programs to improve patients' knowledge of hypertension may enhance their adherence to a low-salt diet for optimal blood pressure control.

Key words: Dietary Salt Reduction adherence, hypertension related knowledge, staging of *hypertension*

MP-034

Survival Analysis of Hypertensive Patients Undergoing Routine Hemodialysis Based on Interdialytic Blood Pressure

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Abstract

Background: Hypertension is highly prevalent among patients undergoing maintenance hemodialysis and remains a major contributor to cardiovascular morbidity and mortality. Interdialytic blood pressure reflects long-term volume overload and vascular dysfunction; however, its prognostic value for survival remains controversial

Objective: This study aim to analyze and evaluate survival differences among hypertensive hemodialysis patients based on interdialytic blood pressure.

Methods: A cross-sectional analytic study was conducted among 90 patients receiving routine hemodialysis. Patients were categorized according to interdialytic systolic blood pressure into two groups: <130 mmHg and ≥130 mmHg. Demographic, clinical, and laboratory data were obtained from medical records. Survival analysis was performed using Kaplan–Meier curves, and group comparisons were assessed using the log-rank test

Results: The mean age of participants was 55.01 ± 11.02 years, and 55.6% were female. Interdialytic hypertension (≥130 mmHg) was identified in 67.8% of patients. During the study period, the overall mortality rate was 35.6%. Kaplan–Meier survival analysis demonstrated lower cumulative survival among patients with interdialytic blood

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pressure ≥ 130 mmHg compared with those with <130 mmHg; however, the difference between survival curves was not statistically significant (log-rank $p = 0.210$).

Conclusion: Patients with higher interdialytic blood pressure tended to show lower cumulative survival, although no statistically significant difference was observed. These findings indicate that interdialytic blood pressure may remain clinically relevant in hypertensive hemodialysis patients, and further prospective studies with larger sample sizes are required

Keyword: Hypertension; Hemodialysis; Survival analysis; Interdialytic blood pressure.

MP-035

Diastolic Dysfunction in Patients With Hypertension : A Comparison of the 2025 American Society of Echocardiography Update With the 2016 Guidelines on Diastolic Function

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Abstract

Background: Left ventricular diastolic dysfunction is a common cardiac abnormality in patients with hypertension and represents a major contributor to heart failure with preserved ejection fraction. The recent 2025 ASE guideline update introduces refined parameters that may

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significantly reclassify the severity of diastolic dysfunction compared to the 2016 recommendations, potentially impacting clinical decision-making for hypertensive patients.

Objective : To compare the 2025 ASE guideline update on left ventricular diastolic dysfunction grading in patients with hypertension with the 2016 ASE guideline.

Method : This was a cross-sectional study included 75 hypertensive patients who underwent transthoracic echocardiography. Diastolic function was graded according to both ASE 2016 and ASE 2025 recommendations into normal diastolic function, Grade I, Grade II, or Grade III diastolic dysfunction. The distribution of grades was compared between the two guidelines. Agreement between grading systems was assessed using Chi-Square test.

Results : Based on the ASE 2016 criteria, diastolic dysfunction was evenly distributed across Grade I, Grade II, and Grade III (each accounting for 33.3%). In contrast, application of the ASE 2025 criteria resulted in a higher proportion of patients classified as having normal diastolic function (22.7%). Reclassification predominantly occurred among patients previously categorized as Grade I under ASE 2016, of whom 68.0% were reclassified as normal by ASE 2025. A statistically significant association between the two grading systems was observed (Chi-square test, $p < 0.001$).

Conclusion : The 2025 American Society of Echocardiography guidelines significantly influence the grading of diastolic dysfunction in patients with hypertension, particularly classified most patients into normal diastolic function.

Keywords : Diastolic dysfunction; Hypertension

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Table 1. Comparison Between Diastolic Dysfunction Grading According to ASE 2016 and ASE 2025 (Chi-square Analysis)

		ASE2025				P-Value
		Normal	Grade 1	Grade 2	Grade 3	
ASE2016	Grade 1	17 (68.0%)	8 (32.0%)	0 (0%)	0 (0%)	P<0.001
	Grade 2	0 (0%)	3 (12.0%)	22 (88.0%)	0 (0%)	
	Grade 3	0 (0%)	0 (0%)	1 (4.0%)	24 (96.0%)	

MP-036

Reframing Primary Hypertension Through an Early-Life Perspective: A Systematic Review and Meta-Analysis of Lifestyle and Psychological Aspects in Young and Middle-Aged Adults

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Abstract

Background: Primary hypertension is no longer confined to older age. Its growing presence among younger populations signals a shift in epidemiological patterns, yet evidence on the association of lifestyle and psychosocial factors in young and middle-aged adults remains limited.

Objective: This meta-analysis aimed to evaluate the pooled odds ratio of sleep quality, physical activity, body mass index (BMI), and

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psychological stress for primary hypertension among young and middle-aged adults.

Method: Studies published up to January 2026 were identified from PubMed, Scopus, EBSCO, Epistemonikos, and supplementary searches via Google Scholar. Four reviewers independently conducted study selection and data extraction. JASP software was used to calculate pooled odds ratios and assess heterogeneity.

Result: Twenty studies were included (17 cross-sectional, 2 cohort, and 1 case-control), comprising 411,215 participants. Higher BMI was strongly associated with increased hypertension risk (OR 2.26 [1.84–2.68]; $p < 0.001$). Meanwhile, poor sleep quality (OR 3.44 [-0.06–6.95]; $p = 0.053$), lower physical activity (OR 4.55 [-1.34–10.44]; $p = 0.099$), and higher psychological stress (OR 3.40 [-5.04–11.84]; $p = 0.225$) showed positive but statistically non-significant associations. Studies with insufficient data were narratively synthesized ($n = 9$), all demonstrating positive associations in a consistent direction.

Conclusion: This study identified elevated BMI as a factor associated with primary hypertension among young and middle-aged adults. Poor sleep quality, physical inactivity, and psychological stress showed positive but non-significant associations. These findings highlight lifestyle and psychosocial factors for early hypertension prevention and risk stratification.

Keywords: *Sleep quality; physical activity; body mass index; psychological stress; primary hypertension.*

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MP-037

Silent Night, Rising Pressure: The Link Between Obstructive Sleep Apnea and Hypertension - A Systematic Review and Meta-Analysis

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Abstract

Background: Obstructive sleep apnea (OSA) is a common and underdiagnosed sleep-related breathing disorder that has been increasingly linked to adverse cardiovascular outcomes, particularly hypertension.

Objective: This systematic review and meta-analysis aimed to synthesize and quantify the available evidence on the association between obstructive sleep apnea and hypertension.

Methods: A systematic review and meta-analysis were conducted in accordance with PRISMA and MOOSE guidelines. PubMed, Embase, Web of Science, and Scopus were searched from inception to January 6, 2026 for observational studies and randomized controlled trials evaluating the association between OSA and hypertension in adult populations. Eligible studies reported effect estimates such as odds ratios, relative risks, hazard ratios, or blood pressure differences with corresponding 95% confidence intervals.

Results: Fifteen studies published between 2007 and 2025, encompassing several thousand participants. Across studies, OSA was consistently associated with a higher prevalence and incidence

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of hypertension, with stronger associations observed in moderate to severe disease. Meta-analysis demonstrated that OSA increased the incidence of hypertension by 4.61-fold (OR: 4.61, 95% CI: 3.56–5.97). Subgroup analyses showed similarly elevated risks in cohort studies (OR: 4.00, 95% CI: 3.20–5.01), case-control studies (OR: 4.20, 95% CI: 1.70–10.38), and randomized controlled trials (OR: 5.36, 95% CI: 4.62–6.22). No significant publication bias was detected.

Conclusion: This systematic review and meta-analysis provides robust evidence that obstructive sleep apnea is strongly associated with an increased risk of hypertension, particularly in individuals with moderate to severe disease and resistant or uncontrolled blood pressure.

Keywords: obstructive sleep apnea, hypertension, resistant hypertension, sleep-disordered breathing, systematic review, meta-analysis

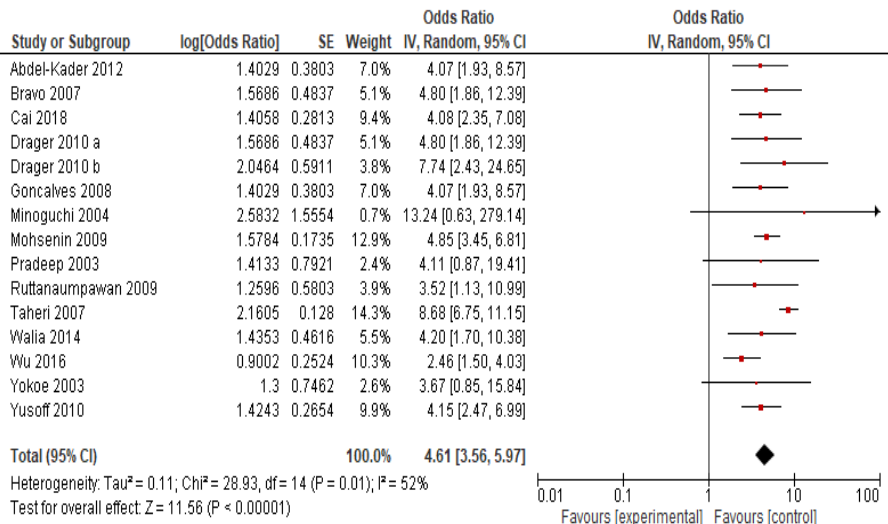


Figure 1. Forest Plot of Meta-Analysis for Odds Ratios and 95% Confidence Intervals.

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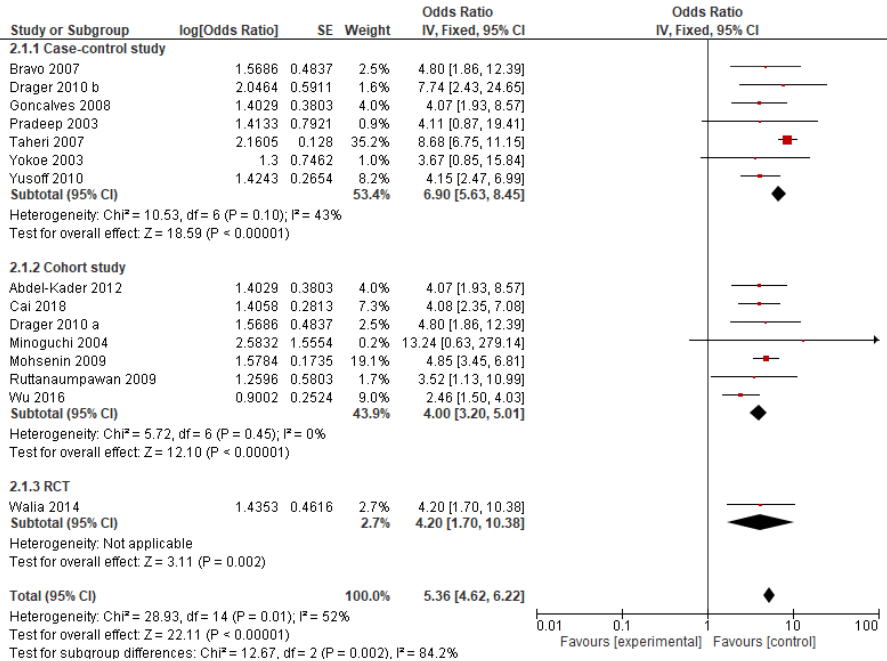


Figure 2. Forest Plot of Meta-Analysis: Effect of Experimental Intervention versus Control in Case-Control, Cohort, and RCT Studies

MP-038

Hidden Risk Beyond the Clinic: A Systematic Review and Meta-Analysis of Risk Factors for Masked Hypertension in Normotensive Populations

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Background: Masked hypertension, characterized by normal office blood pressure but elevated out-of-office measurements, is a common yet underdiagnosed condition associated with increased cardiovascular

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risk. Evidence on its risk factors in normotensive populations remains inconsistent.

Objective: To systematically evaluate risk factors associated with masked hypertension among normotensive populations.

Methods: A comprehensive search in PubMed, Scopus, EBSCO, and ScienceDirect was conducted until January 13, 2026. Univariate and multivariate odds ratio (OR) were extracted from observational studies evaluating the risk factors for masked hypertension among normotensive populations. Meta-analysis was performed using a random-effects inverse-variance model with DerSimonian and Laird estimation. Study quality was assessed using the Newcastle-Ottawa scale. Pooled effect sizes with 95% confidence interval (CI) were calculated.

Results: Seven studies involving 3633 participants were included. In univariate analyses, older age (OR 1.07 ; 95% CI: 1.02-1.13; $p = 0.013$), male sex (OR 1.83 ; 95% CI: 1.26-2.66; $p = 0.002$), alcohol consumption (OR 2.70 ; 95% CI: 1.04-6.96; $p = 0.040$), and current smoking (OR 2.03 ; 95% CI: 1.47-2.79; $p = < 0.001$) were significant risk factors associated with masked hypertension. The associations of older age and male sex remained statistically significant in multivariate analyses (OR 1.04 ; 95% CI: 1.00-1.08; $p = 0.059$; OR 1.66 ; 95% CI: 1.10-2.51; $p = 0.017$).

Conclusion: Masked hypertension in normotensive individuals is associated with risk factors of older age and male sex with additional contributions from smoking and alcohol consumption. These findings highlight the need for targeted out-of-office blood pressure monitoring to improve early detection and cardiovascular risk stratification.

Keywords: *Risk factors; Masked hypertension; Observational studies; Meta-analysis*

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MP-039

Association Between Peri-Operative Hypertension and Post-Operative Cerebral Hyperperfusion Syndrome in Carotid Artery Stenosis Patients: A Systematic Review

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ABSTRACT

Background: Cerebral hyperperfusion syndrome (CHS) is a rare but potentially life-threatening complication following carotid endarterectomy (CEA), resulting from a pathological increase in cerebral blood flow that may lead to severe neurological sequelae. Clinically, CHS presents with a broad spectrum of symptoms, including ipsilateral headache, ocular pain, vomiting, focal neurological deficits, seizures, and impaired consciousness. Peri-operative hypertension has been proposed as a key precipitating factor contributing to CHS.

Objective: This systematic review aimed to evaluate the association between peri-operative hypertension and the incidence of CHS in patients undergoing CEA.

Methods: A PICO-based systematic search was conducted across PubMed, EBSCOhost, Scopus, and ScienceDirect. Study selection was performed in two stages (title/abstract and full-text) using Rayyan by two independent reviewers. Methodological quality was appraised using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist. Data synthesis focused on peri-operative blood pressure parameters and the incidence of post-operative CHS.

Results: From 307 records identified, 150 duplicates were removed, and eight studies met the inclusion criteria. Preoperative diastolic hypertension demonstrated a modest association with CHS risk (OR 1.04; 95% CI 0.995–1.08). Intraoperative factors, including elevated peak mean arterial pressure (MAP) and systolic blood pressure (SBP),

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as well as increased blood pressure variability, were significantly associated with CHS development ($p < 0.005$). Additionally, five studies consistently identified postoperative systolic and diastolic hypertension as major predictors of CHS.

Conclusion: Peri-operative hypertension is strongly associated with the development of CHS following CEA. These findings underscore the importance of proactive and stringent blood pressure control throughout the peri-operative period to mitigate CHS risk.

Keyword: Peri-operative hypertension, Cerebral hyperperfusion syndrome, Carotid endarterectomy, carotid artery stenosis.

MP-040

Community-Enabled Precision Hypertension Care for Kidney Protection: A Systematic Review and Meta-Analysis of Albuminuria Outcomes

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ABSTRACT

Introduction: Community-enabled precision hypertension care integrates individualized blood pressure management with community-based delivery models and has emerged as a potential strategy for kidney protection. However, its quantitative effect on albuminuria outcomes remains variably reported.

Objective: To systematically review and synthesize available evidence on the impact of community-enabled precision hypertension care on albuminuria outcomes.

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Methods: We conducted a systematic review and meta-analysis in accordance with PRISMA 2020 guidelines. Literature searches were performed in ScienceDirect, Embase, and Scopus for studies published since January 2020. Eligible randomized or cluster-randomized trials compared community-enabled, individualized hypertension care with usual care and reported quantitative albuminuria outcomes. Risk of bias was assessed using the Cochrane RoB-2 tool. Pooled estimates were synthesized using inverse-variance fixed-effect models where clinically appropriate.

Results: The initial literature search identified 880 records, of which 10 studies met the inclusion criteria and were included in the quantitative synthesis, comprising 2,257 participants in intervention groups and 2,214 participants in control groups. Community-enabled precision hypertension care was associated with statistically significant reduction in albuminuria compared with standard care (pooled mean difference -0.22 ; 95% CI -0.43 to -0.01). Substantial heterogeneity was observed ($I^2 = 88\%$), likely reflecting differences in intervention intensity, monitoring frequency, decision-support systems, medication titration strategies, and baseline renal risk across studies.

Conclusion: Community-enabled precision hypertension care is associated with a modest but significant reduction in albuminuria, supporting its potential role in kidney protection beyond conventional clinic-based hypertension management. High heterogeneity highlights the importance of implementation context and the need for standardized albuminuria reporting in future trials.

Keywords: community-enabled care; precision hypertension management; albuminuria; chronic kidney disease progression; blood pressure control.

MP-041

Personalising Blood Pressure Management in Hypertensive Chronic Kidney Disease: Evidence from SGLT2 Inhibitors—A Systematic Review and Meta-Analysis**Marthen Kause¹, Cydri Dendo Ngara², Sri Djahi³, Yosefania Markus⁴***¹School of Cardiovascular and Metabolic Health, University of Glasgow, UK**²Ari Canti Hospital, Bali, Indonesia**³Sito Husada Hospital, Atambua, Indonesia**⁴Siloam Hospitals, Kupang, Indonesia***Abstract**

Background: Hypertension is a major modifiable risk factor driving cardiovascular morbidity and progressive renal dysfunction in chronic kidney disease (CKD). Sodium–glucose cotransporter-2 inhibitors (SGLT2i) provide established cardio-renal protection; however, their blood pressure (BP)–lowering effects in hypertensive CKD populations, irrespective of diabetes status, remain incompletely characterised.

Objective: To evaluate the impact of SGLT2 inhibitors on blood pressure in hypertensive CKD.

Methods: PubMed, Embase, and the Cochrane Library were searched to identify randomised controlled trials evaluating SGLT2 inhibitors in adults with CKD (eGFR <60 mL/min/1.73 m²) and coexisting hypertension. Primary outcomes were changes in systolic and diastolic BP (SBP and DBP). Secondary outcomes included changes in eGFR and renal safety outcomes. Risk of bias was assessed using RoB 2, and random-effects models were applied.

Results: Eleven RCTs comprising 20,023 participants were included and demonstrated a significant reduction in SBP compared with placebo (–3.98 mmHg, 95% CI –4.81 to –3.16; p<0.00001), with a consistent reduction in DBP (–1.47 mmHg, 95% CI –2.12 to –0.82; p<0.00001).

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Moderate-to-high heterogeneity was observed. SGLT2 inhibitors were also associated with reduced risk of end-stage kidney disease (HR 0.69, 95% CI 0.62–0.77), acute kidney injury (HR 0.81, 95% CI 0.67–0.98), and hyperkalaemia (HR 0.74, 95% CI 0.62–0.88), with no significant effect on eGFR change.

Conclusion: SGLT2 inhibitors confer clinically relevant BP reduction in hypertensive CKD patients, complementing their established cardio-renal benefits. These findings support their role as adjunctive therapy for blood pressure management and provide insight into cardiovascular risk reduction in this high-risk population.

MP-042

Beyond Mean Blood Pressure: Blood Pressure Variability as an Independent Predictor of Cardio-Cerebro-Renal Outcomes : A Systematic Review

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Abstract

Background: In addition to mean blood pressure, blood pressure variability (BPV) has emerged as an important prognostic factor that may contribute to vascular damage and dysfunction of the heart, brain, and kidneys.

Objective: This systematic review aimed to determine whether blood pressure variability independently predicts cardio-cerebro-renal outcomes.

Methods: PubMed and Scopus databases were systematically searched. Of 1,125 records identified, 702 duplicates were removed. After title and

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abstract screening, 31 studies were included for qualitative synthesis. Eligible studies evaluated short-term or long-term BPV and reported cardiovascular, cerebrovascular, or renal outcomes.

Results: Most studies showed that higher BPV, particularly visit-to-visit and long-term variability, was independently associated with increased risk of cardiovascular events, stroke, and all-cause mortality after adjustment for mean blood pressure and conventional risk factors. Consistent associations were reported in hypertensive and elderly populations across large cohort and trial-based studies. Renal outcomes were also adversely affected, with higher BPV associated with faster decline in kidney function and increased risk of chronic kidney disease. Mechanistic studies suggested that increased arterial stiffness and vascular remodeling may mediate the harmful effects of BPV on target organs.

Conclusion: Blood pressure variability is an independent predictor of cardio-cerebro-renal outcomes beyond average blood pressure values. Incorporating BPV assessment into routine hypertension management may improve risk stratification and support individualized treatment strategies. Further studies are needed to establish standardized BPV measurement and evaluate interventions targeting BPV reduction.

Keywords : Blood Pressure Variability; Hypertension; Cardiovascular Outcomes; Cerebrovascular Outcomes; Renal Outcomes

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MP-043

A Systematic Review and Meta-Analysis of Baseline Predictors of Post-Procedural Ambulatory Blood Pressure Reduction in Resistant Hypertension Undergoing Renal Denervation: Who is the Ideal Candidate?

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Abstract

Background: Renal denervation (RDN), an emerging device-based therapy for resistant hypertension (RH), has heterogeneous post-procedural BP response across RH patients. As ambulatory blood pressure (ABP) is a stronger predictor of hypertensive-related cardiovascular events than office BP, identifying predictors of post-procedural ABP reduction is critical for appropriate RDN patient selection.

Objective: To systematically evaluate baseline predictors of ABP-based RDN responders among RH patient undergoing RDN.

Method: PubMed, Scopus, and EBSCO were systematically searched. RDN responders were defined as ≥ 5 -mmHg or ≥ 10 -mmHg reduction in 24-h/daytime systolic ABP within 12 months post-RDN. Pooled mean differences (MD) and odds ratios (OR) were calculated using random-effects models, Subgroup analysis restricted to multivariate studies was also conducted.

Results: Twenty studies (1 RCT, 19 observational studies) comprising

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2,523 patients with RH undergoing radiofrequency- or ultrasound-based RDN were analyzed. Responders with ≥ 5 -mmHg and ≥ 10 -mmHg systolic ABP reduction had significantly higher baseline 24-h ABPM SBP (MD 8.06 and 10.62), daytime ABPM SBP (MD 6.88 and 8.33), and 24-h ABPM DBP (MD 4.81 and 6.98) compared with non-responders (all $p < 0.05$). Furthermore, each 1-mmHg increment in baseline 24-h systolic ABPM was significantly associated with a higher odds of being a ≥ 5 -mmHg 24-h systolic ABPM responder (OR 1.12, $p < 0.001$, $I^2 = 0\%$). However, no significant associations were observed for age, BMI, comorbidities, baseline medications, hypertension phenotypes, and nocturnal BP pattern.

Conclusion : Higher baseline ABP, particularly 24-h systolic ABP, predicts RDN responder, highlighting ABPM-guided RDN patient selection in RH.

MP-044

Beyond Mean Blood Pressure: Visit-to-Visit Blood Pressure Variability and Cardiovascular Outcomes — A Systematic Review and Meta-Analysis

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Background: Mean blood pressure (BP) is the primary target in cardiovascular (CV) risk management but may not fully capture long-term risk. Visit-to-visit BP variability (BPV) is an independent predictor of adverse CV outcomes, even in patients with controlled mean BP, indicating residual risk. Its prognostic significance beyond mean BP across outcomes is inconsistently quantified.

Objective: To evaluate the association between visit-to-visit BPV and CV outcomes beyond mean BP.

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Methods: Systematic search of PubMed, Cochrane, and Embase using MeSH terms including “Blood Pressure Variability”, “Visit-to-visit”, “Cardiovascular Outcomes”. Included were randomized controlled trials and clinical trials enrolling adults aged ≥ 18 years reporting cardiovascular, renal, bleeding, or mortality outcomes. Two reviewers independently screened studies. Meta-analysis used a random-effects model, pooling hazard ratios (HRs) with 95% confidence intervals (CIs), and heterogeneity was assessed using the I^2 statistic. Study quality and risk of bias were assessed using established tools appropriate to study design.

Results: Seven studies (6 RCTs, 1 CT) with ~63,000 adults (18–80 years) included. High systolic BPV associated with increased risks of ischemic and hemorrhagic stroke, myocardial infarction (MI), heart failure (HF), renal impairment, major bleeding, and mortality, independent of mean systolic BP. Meta-analysis showed BPV linked to higher composite CV outcomes risk, even in well-controlled BP. In prespecified diabetes subgroups: stroke (HR 2.41, 95% CI 1.67–2.90), CV events (HR 2.39, 95% CI 1.97–2.89), renal impairment (HR 1.69, 95% CI 1.26–2.26), all-cause mortality (HR 1.52, 95% CI 1.19–1.94; all $P < 0.001$). Dose–response: 23% increase in adverse outcomes per BPV increment (HR 1.23, 95% CI 1.06–1.43). Intensive BP control attenuated BPV impact, residual risk persisted.

Conclusion: Visit-to-visit BPV is associated with adverse CV, renal, bleeding, and mortality outcomes independent of mean BP, supporting long-term BP stability as a critical therapeutic target beyond mean BP reduction.

Keywords: Blood pressure variability; Visit-to-visit blood pressure variability; Cardiovascular outcomes; Hypertension; Residual cardiovascular risk.

MP-045

Effects of Eplerenone Add-On Therapy on Left Ventricular Hypertrophy Regression in Resistant Hypertension: A Meta-Analysis

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Abstract

Background: Resistant hypertension is commonly associated with left ventricular hypertrophy, a strong predictor of adverse cardiovascular outcomes. Although eplerenone has been proposed as add-on therapy, evidence for its effect on LVH regression remains limited.

Objective: To evaluate the effect of eplerenone add-on therapy on regression of left ventricular hypertrophy in patients with resistant hypertension.

Methods: Randomized controlled trials comparing eplerenone add-on therapy with placebo or standard treatment in adults with resistant hypertension were identified through searches of PubMed, Scopus, and Cochrane. LVH regression was assessed by changes in left ventricular mass or mass index measured by MRI or echocardiography. Standardized mean differences were pooled using a random-effects model, with heterogeneity assessed by the I^2 statistic and subgroup analyses conducted by imaging modality.

Results: Two randomized controlled trials involving a total of 153 participants (77 in the eplerenone group and 76 in the control group) were included. Eplerenone add-on therapy was associated with a significant reduction in LVH compared with control (SMD -0.66 , 95% CI -1.04 to -0.28 ; $p = 0.0006$). Heterogeneity was low ($I^2 = 23\%$). Subgroup analysis demonstrated no significant difference in treatment effect between imaging modalities (p for subgroup differences = 0.26), indicating consistent effects across measurement methods.

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Conclusions: Eplerenone add-on therapy reduces left ventricular hypertrophy in resistant hypertension with a moderate effect size and low heterogeneity. Despite the limited number of trials, consistent findings support its role in reversing target organ damage, although larger randomized studies are needed to confirm long-term outcomes.

Keywords: Resistant hypertension; eplerenone; left ventricular hypertrophy; mineralocorticoid receptor antagonist; meta-analysis

MP-046

Sunlight-Related Exposure (Ultraviolet Radiation and Outdoor Light) and Hypertension: A Systematic Review and Meta-analysis of Interventional and Observational Studies

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Abstract

Background: Sunlight-related exposure, including ultraviolet radiation (UVR), has been hypothesised to influence blood pressure through mechanisms beyond vitamin D, potentially involving nitric oxide-mediated vasodilation. However, evidence across interventional and observational studies remains inconsistent.

Objective: To synthesise evidence on the association between sunlight-related exposure (UVR/UVA and outdoor light) and hypertension-related outcomes from interventional and observational studies.

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Methods: We conducted a systematic review and meta-analysis of human studies according to PRISMA 2020 Guideline.. Eligible studies included interventional trials of UVA/UVR exposure and observational studies assessing sunlight/UVR/outdoor light in relation to blood pressure or hypertension. For interventional studies, the primary outcome was diastolic blood pressure (DBP) change (mmHg); for observational studies, the primary outcome was hypertension (ratio measures).

Results: 7 studies met inclusion criteria (2 interventional; 5 observational). In interventional studies, UVA exposure produced a greater DBP reduction than control (MD -2.81 mmHg, 95% CI -5.06 to -0.56 ; $I^2=39\%$). In observational studies, higher sunlight-related exposure was associated with lower hypertension risk/prevalence (RR 0.84, 95% CI 0.72 to 0.98), with substantial heterogeneity ($I^2=93\%$). Sensitivity analyses indicated instability of the pooled observational estimate; restricting synthesis to more comparable individual-level exposure proxies reduced heterogeneity ($I^2=0\%$) and strengthened the association (RR 0.71, 95% CI 0.65 to 0.78). Certainty of evidence was low for interventional DBP and very low for observational hypertension.

Conclusions: Interventional evidence suggests UVA exposure may modestly lower DBP, while observational evidence indicates a potential inverse association between sunlight-related exposure and hypertension.

Keywords: *ultraviolet radiation; sunlight exposure; outdoor light; hypertension; systematic review - meta-analysis*

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MP-047

Intensive (<120 mmHg) Versus Standard Blood Pressure Targets: Cardiovascular Outcomes and Safety in Adults at Elevated Cardiovascular Risk — A Systematic Review and Meta-Analysis

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Background: Optimal blood pressure (BP) targets for cardiovascular risk reduction remain debated, particularly regarding the balance between cardiovascular benefit and safety with intensive BP lowering. While intensive systolic BP targets (<120 mmHg) have demonstrated potential benefits in selected populations, heterogeneity of outcomes and concerns regarding increased adverse events continue to limit consensus in clinical practice.

Objective: To systematically evaluate the effects of intensive (<120 mmHg) versus standard blood pressure targets on cardiovascular outcomes and safety in adults at elevated cardiovascular risk.

Methods: A systematic search of PubMed, Embase, Scopus, and the Cochrane Library was conducted from inception to January 2026 to identify randomized controlled trials comparing intensive and standard BP targets in adults at elevated cardiovascular risk. Random-effects meta-analyses were performed for time-to-event outcomes using hazard ratios. Safety outcomes were analyzed using risk ratios, while trials with heterogeneous outcome definitions were synthesized narratively.

Results: Four randomized controlled trials met the inclusion criteria, of which two large trials comprising 14,094 participants were included in the quantitative synthesis. Intensive BP lowering was associated with a significant reduction in major adverse cardiovascular events (HR 0.81, 95% CI 0.70–0.94). No significant pooled effect was observed

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for all-cause mortality (HR 0.88, 95% CI 0.61–1.28) or cardiovascular mortality (HR 0.78, 95% CI 0.42–1.44), with substantial heterogeneity. Safety analyses demonstrated higher risks of hypotension, syncope, bradycardia, and acute kidney injury with intensive BP targets. Trials evaluating less stringent systolic targets (<130 mmHg), including STEP and Cardio-SIS, showed consistent direction of cardiovascular benefit and were summarized narratively.

Conclusion: Intensive systolic BP targets (<120 mmHg) reduce major cardiovascular events in adults at elevated cardiovascular risk but do not confer consistent mortality benefits and are associated with increased adverse events. Narrative evidence supports a broader cardiovascular benefit of lower BP targets, emphasizing the importance of individualized BP target selection that balances cardiovascular benefit–risk considerations.

Keywords: Blood pressure targets; Intensive blood pressure control; Cardiovascular outcomes; Safety; Meta-analysis; Hypertension

MP-048

Baxdrostat for Resistant Hypertension: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

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Background: Patients with resistant hypertension have a substantially higher risk of cardiovascular complications, including stroke, left ventricular hypertrophy, and heart failure, underscoring the need for more effective therapeutic strategies. Aldosterone excess plays a central role in resistant hypertension, and baxdrostat, a selective aldosterone synthase inhibitor, has emerged as a novel targeted therapy.

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Objective: To evaluate the efficacy of baxdrostat in reducing systolic blood pressure (SBP) among patients with resistant hypertension.

Methods: A systematic literature search was conducted in PubMed, Scopus, and the Cochrane Library to identify randomized controlled trials evaluating baxdrostat in resistant or uncontrolled hypertension. Study quality and risk of bias were assessed using the Cochrane Risk of Bias tool. A random-effects meta-analysis using the inverse variance method was performed to pool the mean difference (MD) in SBP between baxdrostat and placebo groups. Variations in baxdrostat dosage and treatment duration, ranging from 12 to 26 weeks, were pooled at the study level.

Results: Three randomized controlled trials, including two phase 2 trials and one phase 3 trial, involving 1,262 participants (863 receiving baxdrostat and 399 receiving placebo) were included. Baxdrostat significantly reduced SBP compared with placebo, with a pooled MD of -8.66 mmHg (95% CI -11.35 to -5.97 ; $p < 0.01$). No significant heterogeneity was observed across studies ($I^2 = 0\%$), indicating consistent treatment effects. Overall risk of bias was low across included trials.

Conclusion: Baxdrostat demonstrated a clinically meaningful and consistent reduction in systolic blood pressure in patients with resistant hypertension. Although the number of available trials remains limited, these findings support the potential role of aldosterone synthase inhibition as a promising therapeutic approach for resistant hypertension. Further large-scale studies with longer follow-up are warranted to confirm long-term efficacy and safety.

Keywords: Baxdrostat; Resistant Hypertension; Aldosterone Synthase Inhibitor; Systolic Blood Pressure; Meta-analysis

MP-049

Prevalence and Mortality Risk of Intradialytic Hypertension in Patients with End-Stage Kidney Disease: A Meta-Analysis

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Simanjuntak², Nicolas Hizkia Ariandi¹, Jessy Sestomi¹,
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Background: *Intradialytic hypertension* (IDHTN) is a common but often overlooked complication of haemodialysis, closely associated with negative clinical outcomes. This systematic review and meta-analysis aimed to determine the worldwide prevalence of IDHTN and assess its effect on all-cause mortality in patients with *end-stage kidney disease* (ESKD).

Objective: This study aimed to quantify the prevalence of IDHTN and assess its association with mortality in patients receiving maintenance haemodialysis for end-stage kidney disease.

Methods: Various databases were utilised and keywords were searched based on the PECOS framework. JBI risk of bias were used for bias analysis, followed by proportion meta-analysis analysis using R Studio. Data was collated using forest plots, comparative tables and for data visualisation.

Results: We analyzed 30 studies from, involving 117,010 haemodialysis patients. We found that intradialytic hypertension (IDHTN) affected 26.6% of patients, though this rate varied depending on how it was diagnosed. IDHTN happened in 19.9% of dialysis sessions and was not linked to pre-dialysis blood pressure. Importantly, patients with IDHTN had a 37% higher risk of death (HR 1.37; 95% CI: 1.09–1.65). These

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results show that IDHTN is common and independently predicts worse outcomes in ESKD.

Conclusion: IDHTN is highly prevalent but lacks diagnostic consistency across studies, highlighting the urgent need for a unified definition to guide research and practice. The robust association between IDHTN and increased mortality underscores the clinical importance of achieving more effective blood pressure control for patients undergoing haemodialysis.

Keywords: *Intradialytic hypertension; haemodialysis; Meta-analysis;*

MP-050

Association between Impaired Lung Function Parameters and Blood Pressure Among Adults: Systematic Review

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Background: Chronic obstructive pulmonary disease (COPD) and impaired lung function have been recognized as independent risk factors for cardiovascular disease. Alterations in blood pressure regulation have been proposed as a possible mechanism. Findings of abnormal blood pressure patterns in individuals with impaired lung function indicate the need to further evaluate its association with blood pressure levels.

Objective: To evaluate whether decreasing lung function across quartiles is associated with higher blood pressure.

Method: A systematic search following PRISMA guidelines was conducted in PubMed, EBSCOHost, and Taylor & Francis (December

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19, 2025) was conducted using terms related to "Forced Expiratory Volume", "Forced Vital Capacity", "systolic blood pressure", and "diastolic blood pressure". Eligible studies included individuals without known clinical respiratory disease who underwent spirometric assessment of lung function (FEV₁, FVC, or VC) and measurement of blood pressure. Outcomes assessed were ambulatory or office blood pressure across quartiles of lung function. Risk of bias was evaluated using JBI critical appraisal tools and ROBINS-E.

Result: A total of 1 cohort and 3 cross-sectional studies with a total of 14,001 patients were included. One study showed some concerns regarding risk of bias based on ROBINS-E, while three studies were assessed as high quality using the JBI critical appraisal tools. Studies indicate that systolic blood pressure was generally higher in the lowest quartiles of lung function (FEV₁, FVC, or VC) compared with the highest quartiles. Diastolic blood pressure showed smaller and less consistent differences across quartiles. The inverse association between lung function and systolic blood pressure was observed more consistently across different study populations and blood pressure measurement methods.

Conclusion: Overall, lower lung function was associated with higher blood pressure, particularly systolic blood pressure, across multiple observational studies. Lung function parameters may therefore have potential value as additional markers for cardiovascular risk assessment.

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MP-051

Preoperative Anxiety and Its Impact on Perioperative Blood Pressure Instability and Postoperative Outcomes: A Systematic Review and Meta-analysis

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Background : Preoperative anxiety is common among surgical patients and is associated with sympathetic nervous system activation that may contribute to perioperative blood pressure instability. Anxiety-induced catecholamine release can exacerbate hypertension, increase cardiovascular stress, and negatively influence postoperative recovery. Although preoperative anxiety has been linked to adverse postoperative outcomes, its relationship with perioperative blood pressure instability has not been comprehensively synthesized.

Objective: To evaluate the association between preoperative anxiety and perioperative blood pressure instability, as well as postoperative clinical outcomes, using evidence from existing studies.

Method: A systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. Electronic databases were searched for studies assessing preoperative anxiety in adult surgical patients. Anxiety was measured using validated instruments. Outcomes included perioperative blood pressure elevation or variability, postoperative pain, opioid consumption, cardiovascular events, and length of hospital stay. Random-effects models were used to pool effect estimates, and heterogeneity was assessed using the I^2 statistic.

Result: Quantitative synthesis demonstrated that higher preoperative anxiety was associated with significantly worse perioperative outcomes. Meta-analysis of anxiety outcomes showed a moderate pooled reduction in anxiety following perioperative interventions (Hedges $g = -0.51$), indicating a clinically meaningful effect. Across included studies,

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elevated anxiety was consistently associated with greater perioperative blood pressure variability, increased anesthetic and opioid requirements, higher postoperative pain scores, and prolonged recovery. Narrative synthesis further indicated that patients with preexisting hypertension exhibited more pronounced anxiety-related hemodynamic responses.

Conclusion: Preoperative anxiety is associated with perioperative blood pressure instability and adverse postoperative outcomes. As a modifiable upstream determinant of sympathetic activation, anxiety represents an important target for perioperative interventions aimed at improving blood pressure stability, particularly in patients with hypertension or elevated cardiovascular risk.

Keywords: Anxiety; Blood Pressure; Hypertension; Perioperative Care; Surgical Procedures.

MP-052

Breaking Barriers in Hypertension Treatment: A Systematic Review and Meta-Analysis of Zilebesiran the Pioneering RNAi Therapeutic

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Background: Hypertension is a modifiable risk factor for cardiovascular events, stroke and chronic kidney disease. There is urgent need for novel therapeutic strategies that offer simplified dosing schedules and sustain efficacy. Zilebesiran utilizes RNA interference (RNAi) technology to target Renin-Angiotensin-Aldosterone System (RAAS). Zilebesiran offers a long-acting effect, potentially addressing patient adherence that compromises effectiveness of daily oral therapies.

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Objective: This study aims to evaluate safety and efficacy of Zilebesiran in reducing blood pressure.

Methods: This meta-analysis study followed Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) 2020 guidelines. A systematic search from pubmed, cochrane and embase database.

Results: Three RCTs including 1,308 participants fulfilled inclusion criteria. Zilebesiran administration resulted in significant reduction in 24-hour systolic blood pressure (-9.59 mmHg, 95% CI:-9.76 to -9.42) and diastolic blood pressure (-0.82 mmHg, 95% CI:-1.01 to -0.62) at 12 weeks compared to placebo. A statistically significant increase in total adverse events was noted (risk ratio:1.28, 95% CI:1.16 to 1.41), with no notable difference in serious adverse events. Renal safety was evidenced by stable serum creatinine and eGFR values. Inclusion of only three RCTs resulted in relatively small sample size, with participants predominantly of White ethnicity. This underscores the necessity for additional studies involving larger and more ethnically diverse populations.

Conclusions: This meta-analysis showed that Zilebesiran had robust efficacy in lowering blood pressure and maintained an acceptable safety profile, offering a promising option for patients, especially those with difficulties adhering to daily oral therapy.

MP-053

Comparative Efficacy and Potassium Safety of Thiazide-Like Versus Thiazide Diuretics in Hypertension: A Systematic Review and Meta-Analysis

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Background: Current European Society of Cardiology (ESC) guidelines preferentially recommend thiazide-like diuretics over conventional

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thiazide diuretics for hypertension management. However, hydrochlorothiazide (HCTZ) remains the most commonly prescribed agent worldwide. Whether thiazide-like diuretics provide clinically meaningful superiority in blood pressure reduction and potassium safety remains uncertain.

Objective: To compare the efficacy and safety of thiazide-like diuretics (chlorthalidone and indapamide) versus hydrochlorothiazide in adults with hypertension.

Method: A systematic review and meta-analysis of randomized and comparative studies was conducted. Outcomes included changes in systolic blood pressure (SBP), diastolic blood pressure (DBP), serum potassium levels, and incidence of hypokalemia. Pooled estimates were calculated using random-effects models.

Results: Ten studies involving 15,630 participants were included in the analysis. Thiazide-like diuretics significantly reduced SBP (MD: -4.51 mmHg; 95% CI: -8.25 to -0.76 ; $p=0.018$; $I^2=98\%$) and DBP (MD: -2.84 mmHg; 95% CI: -5.46 to -0.22 ; $p=0.034$; $I^2=92\%$) compared with HCTZ. In subgroup analyses, chlorthalidone showed significant reductions in both SBP (MD: -3.39 ; $p=0.028$) and DBP (MD: -2.22 ; $p=0.009$), whereas indapamide did not reach statistical significance. No significant differences were observed in hypokalemia risk (OR: 0.67; 95% CI: 0.15–3.03; $p=0.60$) or mean serum potassium levels (MD: 0.07 mmol/L; $p=0.66$). Results were characterized by substantial heterogeneity and sensitivity to individual studies, particularly for SBP.

Conclusion: Thiazide-like diuretics, particularly chlorthalidone, appear more effective than hydrochlorothiazide in lowering blood pressure, without an increased risk of hypokalemia. However, marked heterogeneity and sensitivity of findings warrant cautious interpretation and support the need for high-quality head-to-head trials.

Keywords: *Hypertension; Thiazide-like diuretics; Hydrochlorothiazide; Blood pressure; Hypokalemia*

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MP-054

Small Doses, Big Impact: Meta-Analysis of Quarter-Dose Quadruple Combination as Initial Hypertension Therapy

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ABSTRACT

Background: Optimal blood pressure (BP) control remains a global challenge. Conventional management titration often fails to achieve early targets, leading to therapeutic inertia and increased cardiovascular risk.

Objective: To evaluate the efficacy and safety of an initial quarter-dose quadruple combination, typically consisting of an ACE-inhibitor/ARB, calcium channel blocker, beta/adrenergic blocker, and diuretic, compared to usual standard care in patients with hypertension.

Methods: We performed a systematic search across PubMed, ScienceDirect, ProQuest, Scopus, Epistemonikos, and Cochrane Library

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following PRISMA Guideline. The primary outcome was achieving the target BP. Secondary outcomes included short-term (4-6 weeks) and long-term (10-12 weeks) BP, ambulatory blood pressure monitoring (ABPM), and safety profiles.

Results: Analysis of Five RCTs revealed that the quadruple combination significantly target BP achievement (RR: 1.91; 95% CI: 1.34–2.73; $p=0.0004$). Short-term reduction was significant for systolic BP (SBP) (MD: -13.00 mmHg; 95% CI: -17.19 to -8.80; $p<0.00001$) and diastolic BP (DBP) (MD: -7.41 mmHg; 95% CI: -9.32 to -5.49; $p<0.00001$). Long-term efficacy remained robust for SBP (MD: -6.44 mmHg; 95% CI: -8.39 to -4.49; $p<0.00001$) and DBP (MD: -7.40 mmHg; 95% CI: -8.84 to -5.97; $p<0.00001$). ABPM showed substantial reductions in SBP (MD: -11.47 mmHg, $p=0.09$) and DBP (MD: -8.73 mmHg, $p=0.08$), though not reaching statistical significance. Safety analysis showed no significant increase in serious adverse events (RR: 1.17, $p=0.66$) and discontinuation due to adverse effects (RR: 1.33, $p=0.47$).

Conclusion: Initial quarter-dose quadruple combination therapy is highly effective, nearly doubling the success rate in achieving BP targets while maintaining a favorable safety profile.

Keywords: *Hypertension, Quarter-dose, Quadruple combination, Meta-analysis, Blood pressure control.*

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MP-055

Short-chain fatty acid–based interventions and blood pressure regulation within the gut–heart axis: a systematic review

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Background: Hypertension remains a major cardiovascular risk factor worldwide. Growing evidence highlights the role of the gut–heart axis in blood pressure regulation, with gut microbiota–derived short-chain fatty acids (SCFAs) emerging as novel therapeutic target. However, clinical findings from human intervention studies remain unclear.

Objective: To systematically review the effects of SCFA-based interventions on blood pressure and to evaluate differences in blood pressure responses according to intervention strategy.

Methods: A systematic search of PubMed, Scopus, and the Cochrane Library was conducted from inception to 2026 to identify published human intervention studies evaluating SCFA-based interventions with blood pressure outcomes. Randomized controlled trials and prospective interventional studies were included. Interventions were categorized as direct SCFA supplementation or SCFA-generating strategies, and findings were synthesized narratively due to heterogeneity.

Results: Four studies met the inclusion criteria, including three main studies and one pilot exploratory study. An SCFA-generating strategy using acetylated and butyrylated resistant starch (HAMSAB) reduced 24-hour ambulatory systolic blood pressure (SBP) by -6.1 mmHg (95% CI -1.4 to -10.7 ; $P < 0.0001$), with consistent reductions during daytime and nighttime periods. In contrast, direct SCFA supplementation demonstrated heterogeneous effects. Oral sodium butyrate increased daytime SBP by $+9.63$ mmHg (95% CI 2.02 – 17.20 ; $P = 0.02$). Oral

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propionate supplementation was associated with a modest reduction in peripheral SBP of -2.4 mmHg, primarily in non-hypertensive individuals. In a pilot crossover study, localized colonic butyrate delivery showed a trend toward reduced 24-hour SBP (-4.0 mmHg; $P=0.054$) and a significant reduction in daytime SBP (137.5 ± 13.46 to 132.9 ± 12.64 mmHg; $P=0.034$).

Conclusion: Blood pressure responses to SCFA-based interventions depend critically on the mode and site of SCFA delivery. SCFA-generating strategies demonstrate consistent and clinically meaningful antihypertensive effects, whereas direct SCFA supplementation yields variable and sometimes adverse blood pressure responses.

Keywords: Short-chain fatty acids; Gut microbiota; Gut–heart axis; Hypertension; Systematic Review

MP-056

“Beyond Blood Pressure: ARNI in Hypertension-Linked Heart Failure—A PRISMA-Guided Systematic Review”

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Background: Angiotensin receptor–neprilysin inhibitors (ARNI), particularly sacubitril/valsartan, are central to contemporary heart failure (HF) care and may offer added value in patients with coexisting hypertension through afterload reduction and natriuretic effects.

Objective: To synthesize recent evidence on the efficacy, blood-pressure effects, and safety of ARNI in patients with HF where hypertension is common or clinically relevant.

Methods: A PRISMA-informed systematic review was conducted using

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the full-text articles provided by the author. Adult studies evaluating ARNI versus ACE inhibitor/ARB or standard care were eligible if they reported HF outcomes and/or blood-pressure effects. Study selection followed a prespecified PICO framework. Owing to heterogeneity in populations and endpoints, results were synthesized narratively.

Results: Seven full texts were assessed; six were included in qualitative synthesis. Across real-world and high-risk cohorts, ARNI use was consistently associated with improved clinical outcomes. A Danish HF_{rEF} cohort reported lower all-cause mortality versus ACEi/ARB (~15% relative reduction). In HF_{rEF} with kidney failure on replacement therapy, ARNI was associated with reduced composite risk of death or hospitalization (HR 0.86) and lower all-cause mortality (HR 0.68). In HF with acute kidney disease, ARNI use was linked to lower mortality (aHR 0.32) and fewer readmissions (aHR 0.61). Evidence also supported systolic/diastolic BP reduction, with hypotension as the key tolerability concern.

Conclusion: ARNI therapy is associated with favorable HF and cardiorenal outcomes and clinically relevant BP lowering, supporting its role in hypertensive HF while underscoring careful titration and monitoring.

Keywords: ARNI; sacubitril/valsartan; hypertension; heart failure; HF_{rEF}; blood pressure; mortality; hospitalization.

MODERATED POSTER SCHEDULE

Saturday, Februari 14th - Venue: Foyer of Ballroom 1

POSTER NUMBER	TITLE	NAME
PD-001	Clinical Characteristics and Outcomes after Endovascular Coiling in Hypertensive Patients with Aneurysmal Subarachnoid Haemorrhage at Dr. Hasan Sadikin General Hospital	Linarto Yunias Lasmono
PD-002	Computational Design of PROTACs Synergistically Targeting the Mineralocorticoid Receptor and SGK1 Axis as a Dual-Degradation Strategy for Resistant Hypertension	I Putu Thio Mahapradana
PD-003	Linear Association Between Hypertension Severity and Isolated Proteinuria in a Non-Diabetic Population	Regina Anjani Budi Pratiwi
PD-004	Indonesian Phytoconstituents as Potential Purinoceptor Antagonists: Targeting a Novel Pathway in Hypertension Through an In Silico Approach	Muhammad Reva Aditya
PD-005	Computational Identification and Pharmacological Evaluation of Thermolysin Inhibitors as Potential Antihypertensive Leads	Abimanyu Sakh
PD-006	VISCERAL FAT, FASTING GLUCOSE, AND HDL CHOLESTEROL AS INDEPENDENT PREDICTORS OF HYPERTENSION	Darren Gosal
PD-007	Blood Pressure Distribution and Associated Risk Factors in the Wonorejo Village Population, Indonesia: Insights from a Descriptive Study	Yusuf Omar Setyoadji
PD-008	Polypharmacy of Hypertension Patients at The Indonesian Christian University Public Hospital	Fikri M / Frits Suling

Poster

POSTER NUMBER	TITLE	NAME
PD-009	Analisis Jumlah Leukosit sebagai Faktor Risiko Terjadinya Stenosis Arteri Koroner Signifikan pada Pasien PJK	Farid Hilmi Tanta Yudina
PD-010	Integrated Bioinformatics Analysis of Differentially Expressed Genes and Pathways in Pulmonary Arterial Hypertension and Alzheimer's Disease	Nicholas Putra Lesmana
PD-011	Explainable Machine Learning for Quality-of-Life Risk Stratification: A Road to Personalized Hypertension Care	Muhammad Iqhrammullah
PD-012	Synergistic Effects of Stingless Bee Honey and Structured Exercise on Glycemic Control, Lipid Profile, and Microalbuminuria in Type 2 Diabetes Mellitus Patients: A Randomized Controlled Trial	Diah Rahmah
PD-013	Hypertension and the Silent Decline of Kidney Function in Indonesia: Insights From a Multicenter Primary Care Study	Ni Made Hustrini
PD-014	Ensemble Machine Learning for Risk Stratification of Uncontrolled Hypertension Among Married Women: Analysis on Indonesian Health Survey 2023	Muhammad Iqhrammullah
PD-015	THE ROLE OF INTRADIALYTIC AEROBIC EXERCISE ON PREDIALYSIS AND POSTDIALYSIS BLOOD PRESSURE IN CHRONIC KIDNEY DISEASE PATIENTS UNDERGOING ROUTINE HEMODIALYSIS	Vincentius Darryl
PD-016	Intradialytic Blood Pressure Variability and Subclinical Left Ventricular Dysfunction in Hemodialysis Patients with Intradialytic Hypertension: A Retrospective Cohort Study	Eddy Yuristo NS

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POSTER NUMBER	TITLE	NAME
PD-017	Artificial Intelligence–Enabled Digital Health Programs for Hypertension Management: Effectiveness of Telemonitoring and Automated Lifestyle Coaching on Blood Pressure Control and Adherence	Muhammad Sobri Maulana
PD-018	The Pressure Chronicles: Blood Pressure Control in a Dual-Hit Hypertensive–Diabetic Rat Model	Reza Wahyuningsih
PD-019	Hyperuricemia as an Independent Predictor of Hypertension: A Large-Scale Cohort Study	Regina Anjani Budi Pratiwi
PD-020	Bioinformatics Analysis of Differentially Expressed Genes in Pulmonary Hypertension due to Left Heart Disease	Elia Setiawan
PD-021	BIOINFORMATICS ANALYSIS ON THE RELATIONSHIP BETWEEN OBESITY AND HYPERTENSION	Stephen Dario Syofyan
PD-022	Integrated Bioinformatics Analysis of PM2.5 Exposure Alters Sodium Homeostasis via SCNN1G Dysregulation in male patient: Implications for Hypertension Pathogenesis	Muhammad Farrel Geraldly
PD-023	Nocturnal Hypertension Among Patients Undergoing ABPM at General Hospital Bogor 2024- 2025	NURUL HASANAH
PD-024	CORRELATION BETWEEN INFARCT AND ISCHEMIC ECG PATTERNS AND DEGREE OF STENOSIS BASED ON VESSEL DISEASE, GENSINI SCORE OF CORONARY ARTERY IN PATIENTS WITH HEART DISEASE	Ali Sofyan Maulidi
PD-025	Not All Hypertension Is the Same: Multimorbidity Phenotypes and Hospitalization Risk From 2024 BPJS Claims	Josia Nathanael Wiradikarta
PD-026	Determinants of Hypertension Adherence at Brati Primary Health Care: Education, Socioeconomic Status, Health Care Access	Marendra Shinary Kartolo

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POSTER NUMBER	TITLE	NAME
PD-027	Risk Factors of Hypertension and the Incidence of Acute Coronary Syndrome Among the Police Advanced Development Program 2025. (PADP 2025) Students of the Indonesian National Police at Bhayangkara Hospital, Setukpa Lemdiklat Polri, Sukabumi, West Java, Indonesia	Muhammad Hatta Mandela
PD-028	Correlation of Hypertension Medication Coverage with Public Seeking Online Hypertension and Smoking-Related Information	Muhammad Luthfi Adnan
PD-029	Global Trends in Nocturnal Hypertension Research: A Bibliometric Study (1976 – 2026)	Vina Sari Nugrahaning Widi
PD-030	Tracing Inflammation to Mortality in Heart Failure with Evidence From Soluble Urokinase-Type Plasminogen Activator Receptor A Systematic Review and Meta-Analysis	Nadya Ulfa Soraya
PD-031	Efficacy, Dose Response, and Safety of Aldosterone Synthase Inhibitors as A Novel Antihypertensive Strategy: A Systematic Review and Meta-Analysis	Aulia Safety Imron
PD-032	Guiding the Breath to Reduce the Pressure: Evaluating Device-Guided Breathing as an Adjunct Therapy in Hypertension - A Systematic Review and Meta-Analysis of Randomized Clinical Trials	Derren David C.H. Rampengan
PD-033	The Effect of Reducing Magnesium Sulfate Duration on Blood Pressure Control and Length of Stay in Preeclampsia: A Systematic Review and Meta-Analysis	Nabila Najwa Nurisma
PD-034	Left atrial strain as an early marker of hypertensive heart disease in adults with primary hypertension: a systematic review	Astagina Naurah

Poster

POSTER NUMBER	TITLE	NAME
PD-035	Effectiveness of Community Health Worker-Facilitated Telehealth Interventions for Hypertension : A Systematic Review and Meta-Analysis	Kendrick Nathaniel Wiradikarta
PD-036	Higher Blood Pressure Variability Predicts Dementia and Cognitive Impairment: Updated Systematic Review and Meta-analysis	Aileen Alessandra Suryohusodo
PD-037	Antihypertensive Chronotherapy and Its Impact on Night-Time Systolic and Diastolic Blood Pressure: A Systematic Review & Meta-Analysis	Ardifa Dwicahya Aprilli Utami
PD-038	Stem Cell-Derived Secretome as a Novel Approach for Multi-Mechanism Resistant Hypertension in End-Stage Renal Failure: A Literature Review	Nur Hamidah H
PD-039	Comparison of Small Interfering RNAs (siRNAs) and Antisense Oligonucleotides (ASOs) as Novel RNA-targeted Therapeutics in Hypertension: A Systematic Review and Network Meta-Analysis	Affan Rayhan Ismail
PD-040	Visit-to-visit Blood Pressure Variability as an Independent Factor in Cognitive Decline in Asian Population: A Systematic Review	Septiana Ailen
PD-041	Perioperative Natriuretic Peptides and the Risk of Acute Kidney Injury After Cardiac Surgery: A Systematic Review and Meta-Analysis	Jihan Nur Azizah
PD-042	A New Hope for Resistant Hypertension: Efficacy and Safety of Baxdrostat and Lorundrostat from a Meta-Analysis of Clinical Trials	Indira salsabilla
PD-043	SGLT2 Inhibitors in Chronic Kidney Disease: Renal and Cardiovascular Outcomes—A Systematic Review Following PRISMA	Bayu Yudha Pratama

Poster

POSTER NUMBER	TITLE	NAME
PD-044	Long-Term Cardiovascular Outcomes of Early-Onset Hypertension in Young Adults: A Systematic Review and Meta-Analysis	Michelle Trisya
PD-045	Safety of Nifedipine and Labetalol in Pregnant Women with Mild Hypertension: A Systematic Review and Meta-Analysis	Andrew Jonathan
PD-046	Tuning Down the Pressure: Assessing the Efficacy of Music as an Adjuvant Therapy in Hypertensive Patients - A Systematic Review and Meta Analysis of Randomized Clinical Trials	Derren David C.H. Rampengan
PD-047	Efficacy of Baxdrostat and Lorundrostat in Uncontrolled and Resistant Hypertension: A Systematic Review of RCTs	Novella Auerellin SP
PD-048	Measurement of Serum Visfatin Level as a Predictor for Hypertension, Heart Failure, and Coronary Artery Disease: A Systematic Review and Meta-Analysis	Zahran Lazuardi Haryawan
PD-049	Reaching the Unreachable Blood Pressure: Efficacy and Safety of Baxdrostat in Uncontrolled and Resistant Hypertension - A Systematic Review and Meta-Analysis	Marcellino Bulain
PD-050	MASKED HYPERTENSION AS AN UNDERRECOGNIZED RISK FACTOR FOR STROKE: A SYSTEMATIC REVIEW AND META-ANALYSIS	Nicholas Hizkia Ariandi
PD-051	Efficacy and Safety of Aprocitentan in Resistant Hypertension : A Systematic Review of RCTs	Aerith Glory Angijaya Tumiwa
PD-052	BMI-Adjusted Electrocardiographic Criteria for Improved Detection of Left Ventricular Hypertrophy and Cardiovascular Prognosis in Obese Hypertensive Population: A Meta-Analysis	Rio Bayu Nugroho

Poster

POSTER NUMBER	TITLE	NAME
PD-053	Less Time, Lower Pressure: Efficacy of Squat Jump Isometric Resistance Training in Reducing Blood Pressure in Hypertension — A Systematic Review and Meta Analysis	Najwa Dean Hasana
PD-054	Comparative Effects of Adjunctive Exercise Modalities on Blood Pressure in Older Adults with Hypertension: A Bayesian Network Meta-Analysis	Aditya Putra
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Clinical Characteristics and Outcomes after Endovascular Coiling in Hypertensive Patients with Aneurysmal Subarachnoid Haemorrhage at Dr. Hasan Sadikin General Hospital

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Abstract

Background: Subarachnoid haemorrhage (SAH) is a highly fatal haemorrhagic stroke, most commonly caused by intracranial aneurysm rupture. Hypertension is a major risk factor associated with poorer outcomes. Endovascular coiling prevents rebleeding, although outcomes depend on initial clinical severity and comorbidities.

Objective: To describe clinical characteristics and outcomes after coiling in hypertensive patients with SAH at Dr. Hasan Sadikin Hospital.

Method: This retrospective descriptive study analysed medical records of hypertensive patients with intracranial aneurysms and SAH who underwent endovascular coiling at Dr. Hasan Sadikin General Hospital (October 2024 - December 2025). Collected data included demographics, initial clinical severity (Hunt and Hess and WFNS grades), radiological severity (modified Fisher scale), timing of coiling, and discharge outcomes assessed by the modified Rankin Scale (mRS). Data were analysed using SPSS.

Result: A total of 21 patients with SAH were included, predominantly female (71%), with a median age of 50–59 years (IQR 50–69). Median initial severity was Hunt and Hess grade 3 (IQR 3–4) and WFNS grade 3 (IQR 2–4), with a median modified Fisher grade of 3 (IQR 2–4). Median

time to coiling was 24–72 hours (IQR 24→72 hours). Overall survival was 76.2%, with a median discharge mRS of 1 (IQR 1–6). All five deaths occurred in patients with mild-to-moderate clinical severity but severe radiological grades, delayed coiling, and were caused by pneumonia or rebleeding.

Conclusion: Early coiling intervention will improve clinical outcomes and survival by reducing rebleeding risk in patients with hypertensive SAH

Keywords : Aneurysmal subarachnoid haemorrhage; Endovascular coiling; Clinical outcome

PD-002

Computational Design of PROTACs Synergistically Targeting the Mineralocorticoid Receptor and SGK1 Axis as a Dual-Degradation Strategy for Resistant Hypertension

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Abstract

Introduction: Resistant hypertension is driven by persistent renal sodium retention mediated by sustained activation of the mineralocorticoid receptor (MR) and its downstream effector SGK1, which together promote sodium reabsorption, tissue remodeling, and inflammation

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despite standard MR antagonist therapy.

Objective: This study aimed to design, using *in silico* approaches, two CRBN-based PROTAC molecules targeting MR and SGK1 separately, as a dual-axis degradation strategy for molecular modulation of resistant hypertension.

Method: Protein–ligand docking was performed using AutoDock Vina, with MR and SGK1 prepared in UCSF Chimera. Finerenone and GSK650394 were used as MR and SGK1 warheads, respectively. Key interactions and solvent-exposed exit vectors were identified using Discovery Studio Visualizer, and 7–12 atom flexible or semi-rigid linkers were attached to thalidomide to generate CRBN-based PROTAC candidates.

Result: Docking analysis demonstrated stable binding of finerenone to MR (–10.1 kcal/mol) and GSK650394 to SGK1 (–9.4 kcal/mol), involving key residues Ser810, Gln776, and Asn770 in MR, and Lys127, Asp177, and Leu176 in SGK1. Redocking validation yielded RMSD values below 2.0 Å, supporting docking reliability. Solvent mapping identified feasible exit vectors on finerenone and GSK650394 suitable for linker conjugation. The designed PROTAC candidates exhibited favorable steric compatibility, with flexible alkyl–ether linkers showing improved geometric adaptability compared to semi-rigid amide linkers.

Conclusion: This *in silico* study demonstrates the rational design of two CRBN-based PROTAC candidates targeting the MR–SGK1 axis, supporting the structural feasibility of a dual-axis targeting strategy and providing a computational basis for further experimental validation in resistant hypertension.

Keywords: PROTAC; Mineralocorticoid Receptor; SGK1; Resistant Hypertension; *In Silico* Drug Design.

PD-003

Linear Association Between Hypertension Severity and Isolated Proteinuria in a Non-Diabetic Population

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Background: Hypertension is a primary driver of nephrosclerosis. In non-diabetic individuals, early kidney damage frequently manifests as isolated proteinuria while conventional renal markers remain normal. This "silent killer" phenomenon necessitates precise risk stratification based on blood pressure severity.

Objective: To evaluate whether every 10 mmHg increase in SBP is linearly associated with the risk of isolated proteinuria in a non-diabetic population.

Method: A cross-sectional analysis was performed on 90,231 non-diabetic adults. The dependent variable was proteinuria status. The primary independent variable was SBP, analyzed in 10 mmHg increments to assess linear risk. Multivariate logistic regression was utilized to determine the association, strictly adjusting for potential confounders including age, gender, BMI, and uric acid levels.

Result: SBP was identified as a robust independent predictor of proteinuria ($p < 0.001$). In the fully adjusted model, every 10 mmHg elevation in SBP increased the likelihood of proteinuria by 26.4% (aOR 1.26; 95% CI 1.24–1.29). Males demonstrated a higher susceptibility compared to females (aOR 1.20; 95% CI 1.09–1.32). Metabolic factors were also significant contributors: each 1 mg/dL rise in uric acid increased risk by 11.9% (aOR 1.12; 95% CI 1.09–1.15), while every 1 kg/m² increase in BMI raised risk by 2.1% (aOR 1.02; 95% CI 1.01–1.03). Age showed a significant positive correlation (aOR 1.007; $p < 0.001$).

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Conclusion: There is a significant linear dose-response relationship between SBP elevation and isolated proteinuria in non-diabetic patients. The risk progressively increases with SBP, male gender, and metabolic comorbidities. These findings highlight that even in the absence of diabetes, incremental blood pressure increases act as a silent driver of early renal injury, mandating strict SBP control to prevent nephrosclerosis.

Keywords: Hypertension severity; Isolated proteinuria; Systolic blood pressure; Non-diabetic population; Early kidney damage/ nephrosclerosis.

PD-004

Indonesian Phytoconstituents as Potential Purinoceptor Antagonists: Targeting a Novel Pathway in Hypertension Through an *In Silico* Approach

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ABSTRACT

Background: Hypertension persists as a leading global cause of cardiovascular mortality, with current therapies often inadequate. Emerging evidence implicates dysregulated purinergic signaling, particularly through the P2X1 receptor, a critical mediator of ATP induced vasoconstriction, as a promising yet underexplored therapeutic target. As a global biodiversity hotspot, Indonesia possesses a vast repository

of natural compounds that may offer novel, selective inhibitors for this pathway.

Objective: This study aimed to systematically identify and evaluate Indonesian phytoconstituents as potent P2X1 receptor antagonists using an integrated *in silico* approach.

Methods: Virtual screening of 6,776 compounds from the Indonesian Medicinal Plant Database was conducted. Following Lipinski's rule filtration, 241 candidates were profiled via PASSOnline, yielding 8 lead compounds. Molecular docking against the P2X1 receptor (PDB ID: 9LX5) was performed using PyRx/AutoDock Vina. Pharmacokinetic and drug-likeness profiles were predicted using SWISSADME.

Results: Four compounds, namely Roxburghine B, Tubotaiwine, β -Lapachone, and Annonaine, exhibited stronger binding affinities (ranging from -8.8 to -8.2 kcal/mol) than the control ligand Tnp-ATP (-8.3 kcal/mol). The remaining four compounds, Cubebin, Cassythicine, Hinokinin, and Ocoteine, showed comparable affinity of -8.0 kcal/mol. All compounds satisfied Lipinski's criteria, indicating favorable drug-likeness and bioavailability.

Conclusion: This study demonstrates that Indonesian phytoconstituents, particularly Roxburghine B and Tubotaiwine, exhibit potent P2X1R antagonistic activity combined with favorable pharmacokinetic profiles. The findings substantiate Indonesia's biodiversity as a significant source for developing novel antihypertensive therapeutics targeting the purinergic pathway.

Keywords: Hypertension, Purinergic P2X1, Molecular Docking Simulation, Phytochemicals, Plant Extracts

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PD-005

Computational Identification and Pharmacological Evaluation of Thermolysin Inhibitors as Potential Antihypertensive Leads

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Background: Arterial hypertension is a worldwide health crisis responsible for 9.4 million deaths each year. It is marked by consistently high blood pressure and impacts over 50% of older adults and 26.9% of the Chilean population. The majority of cases are of unknown origin, which highlights the need for treatment targeting the *renin-angiotensin-aldosterone system* (RAAS). Inhibiting *angiotensin-converting enzyme* (ACE) and *neutral endopeptidase* (NEP) is essential for effectively managing this condition and lowering the risks of cardiovascular mortality associated with it.

Objective: This study evaluates six *in silico* compounds via computational protocols to identify potent, safe antihypertensives targeting the Thermolysin metalloprotease.

Methods: To evaluate six novel antihypertensive leads, we utilized a comprehensive *in silico* pipeline targeting Thermolysin. The methodology encompassed molecular docking, ligand efficiency analysis, and molecular dynamics simulations to quantify binding energetics and stability. Additionally, the physicochemical and toxicological safety of ligands Lig-783, Lig-1022, Lig-1392, Lig-2177, Lig-3444, and Lig-6199 were characterized via ADME-Tox predictive modelling.

Results: Our results demonstrate that all compounds achieved biologically relevant orientations within the Thermolysin active site,

accurately replicating experimental crystal structures. *Lig-2177* and *Lig-3444* emerged as the most potent candidates, exhibiting superior binding stability via MM-GBSA analysis and the lowest K_i values.

Conclusion: Ligands *Lig2177* and *Lig3444* are potent, safe antihypertensive candidates, exhibiting optimal Thermolysin binding stability and favorable ADME-Tox profiles for therapy.

Keywords: *Arterial hypertension; Thermolysin; In silico drug design; Molecular dynamics;*

PD-006

VISCERAL FAT, FASTING GLUCOSE, AND HDL CHOLESTEROL AS INDEPENDENT PREDICTORS OF HYPERTENSION

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Background: Hypertension is a multifactorial condition influenced by body composition, metabolic status, and lifestyle factors. Visceral adiposity has been recognized as a key contributor to blood pressure dysregulation. However, the relative contribution of visceral fat compared with other metabolic parameters in predicting hypertension remains incompletely understood.

Objective: To identify independent predictors of hypertension and evaluate the discriminatory performance of a multivariable model.

Methods: A cross-sectional study was conducted using standardized anthropometric measurements, body composition assessment by bioelectrical impedance analysis, and metabolic blood examinations. Smoking exposure was assessed using the Brinkman Index.

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Hypertension was defined according to Indonesian criteria. Bivariable analyses were performed, and clinically relevant variables were entered into a multivariable logistic regression model adjusted for age and gender. Model discrimination was assessed using receiver operating characteristic (ROC) curve analysis.

Results: A total of 646 adults were included, 187 were hypertensive. Visceral fat was independently associated with hypertension (OR 1.076; 95% CI 1.044–1.109; $p < 0.001$) and showed the strongest association. Fasting plasma glucose was also independently associated with hypertension (OR 1.004; 95% CI 1.000–1.007; $p = 0.038$), while higher HDL cholesterol showed a protective association (OR 0.982; 95% CI 0.970–0.994; $p = 0.003$). Smoking exposure did not retain an independent association. The model demonstrated acceptable discrimination (AUC 0.719; 95% CI 0.679–0.760).

Conclusion: Visceral fat, fasting plasma glucose, and HDL cholesterol are independent predictors of hypertension, with visceral fat showing the strongest association. Integrating visceral adiposity and metabolic factors improves hypertension risk stratification.

Keywords: Hypertension; Visceral adiposity; Metabolic factors; Risk prediction

PD-007

Blood Pressure Distribution and Associated Risk Factors in the Wonorejo Village Population, Indonesia: Insights from a Descriptive Study

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ABSTRACT

Background: Hypertension is a major risk factor for cardiovascular disease and remains one of the many public health challenges in Indonesia.

Objective: This study aims to describe the distribution of blood pressure and possible risk factors in Wonorejo Village, Singosari, Malang, based on the ESC 2024 classification.

Methods: This descriptive study included 18 individuals from 15 families. Using a standard sphygmomanometer, blood pressure was measured twice. Risk factor data were collected using structured questionnaires, including socioeconomic status, education level, diet, smoking, physical activity, health check-ups, participation in health counseling, and the use of medication or herbal remedies. Blood pressure was categorized into non-elevated (<120/70 mmHg), elevated (120-139/70-89 mmHg), and hypertension (\geq 140/90 mmHg) according to ESC 2024 guidelines.

Results: One-third of the studied population was categorized as having elevated blood pressure (11.1%) or hypertension (22.2%). All study participants had a low education level and never attended health counseling. Among individuals with elevated blood pressure, 100% were from the low socioeconomic class. Lifestyle factors also importantly contributed, as all of the respondents with elevated blood pressure and hypertension were smokers with low physical activity. In addition, a considerable proportion of the population preferred herbal medicine

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over prescribed medication, with many not undergoing regular health check-ups.

Conclusion: Low education, smoking, physical inactivity, and limited access to health care services may contribute to increased blood pressure in this population.

Keywords: *Hypertension; Elevated Blood Pressure; Non-Elevated Blood Pressure; Blood Pressure; Risk Factors; Lifestyle.*

PD-008

Polypharmacy of Hypertension Patients at The Indonesian Christian University Public Hospital

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Background: Hypertension is a major contributor to the global and national disease burden, with high prevalence and persistently low rates of blood pressure control, including in Indonesia. As a “silent killer,” hypertension is often asymptomatic and frequently detected only after the occurrence of serious cardiovascular complications. Hypertension results from complex interactions among the brain, heart, and kidneys and is influenced by both non-modifiable and modifiable risk factors. Comorbidities such as diabetes mellitus, dyslipidemia, and chronic kidney disease further exacerbate the condition. The complexity of its

pathophysiology and clinical presentation often necessitates the use of combination therapy with multiple classes of antihypertensive agents in accordance with clinical guidelines, making polypharmacy a common therapeutic approach. However, polypharmacy poses challenges related to medication adherence, drug interactions, and treatment rationality, highlighting the importance of describing polypharmacy patterns in patients with hypertension.

Objective: To describe the pattern of polypharmacy use among patients with hypertension at UKI General Hospital.

Method: This study conducted a retrospective descriptive design with a quantitative approach. The design was used to describe the pattern of polypharmacy use among patients with hypertension based on medical record data of patients treated at Indonesian Christian University Public Hospital from September 2024 - September 2025 period.

Results: The results showed that polypharmacy use among patients with hypertension at Indonesian Christian University Public Hospital was high, particularly among inpatients, in whom all patients experienced polypharmacy, with the majority classified as major polypharmacy (54.5%). In contrast, the prevalence among outpatients was lower (31.5%). Female sex and age ≥ 65 years were the predominant characteristics among patients experiencing polypharmacy in both outpatient and inpatient. Antihypertensive therapy patterns were dominated by diuretics, calcium channel blockers, ARBs/ACE inhibitors, and beta-blockers in accordance with clinical guidelines. Meanwhile, the use of non-antihypertensive medications such as antiplatelets, statins, PPIs, analgesics, and metabolic disease medications reflected the presence of cardiovascular comorbidities, gastrointestinal disorders, and metabolic diseases. The high prevalence of polypharmacy illustrates the clinical complexity and the need for comprehensive therapeutic management in patients with hypertension.

Conclusion: Polypharmacy among patients with hypertension at Indonesian Christian University Public Hospital was more frequently observed in females and patients aged ≥ 65 years. The combination

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patterns of antihypertensive medications in patients with polypharmacy were generally consistent with current treatment guidelines. The use of various non-antihypertensive medications reflects the presence of comorbidities and the need for additional therapies in the comprehensive management of patients with hypertension.

PD-009

Analisis Jumlah Leukosit sebagai Faktor Risiko Terjadinya Stenosis Arteri Koroner Signifikan pada Pasien PJK (Studi Observasional Analitik Pada Pasien PJK Di Rumah Sakit Islam Sultan Agung Semarang)

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Background: Penyakit Jantung Koroner (PJK) berkaitan erat dengan proses inflamasi sistemik. Jumlah leukosit merupakan penanda inflamasi yang rutin diperiksa, namun perannya dalam memprediksi derajat penyumbatan pembuluh darah jantung masih perlu diperjelas, terutama dengan mempertimbangkan faktor risiko konvensional lainnya.

Objective : Penelitian ini bertujuan untuk menganalisis kemampuan jumlah leukosit sebagai prediktor independen terhadap kejadian penyumbatan pembuluh darah berat (stenosis signifikan) serta menentukan nilai ambang batas (*cut-off*) yang optimal pada pasien PJK.

Method: Penelitian observasional analitik dengan pendekatan *cross-sectional* dilakukan di RSI Sultan Agung Semarang menggunakan data sekunder rekam medis periode 2023–2025. Sampel berjumlah 100 pasien PJK yang menjalani kateterisasi jantung/PCI. Analisis data menggunakan Regresi Logistik Biner untuk menguji independensi variabel dan kurva *Receiver Operating Characteristic* (ROC) untuk menentukan nilai ambang batas (*cut-off*).

Result: Jumlah leukosit ditemukan sebagai prediktor klinis terhadap kejadian penyumbatan berat ($p < 0,001$). Hasil regresi logistik

menunjukkan setiap peningkatan jumlah leukosit meningkatkan risiko stenosis signifikan sebesar 1,67 kali lipat (OR 1,674; IK95% 1,263–2,218), mengungguli variabel lain seperti DM, hipertensi, dan merokok. Analisis kurva ROC menunjukkan akurasi prediksi yang baik dengan nilai AUC 0,737 ($p < 0,001$). Nilai ambang batas (*cut-off*) optimal leukosit adalah **9,16** sel/L dengan sensitivitas 79,4% dan spesifisitas 73,0%.

Conclusion: Jumlah leukosit merupakan prediktor klinis untuk mendeteksi penyumbatan jantung berat pada pasien PJK di RSI Sultan Agung Semarang. Nilai leukosit $> 9,16$ sel/L dapat digunakan sebagai indikator kewaspadaan dini sebelum prosedur invasif dilakukan.

Kata kunci: Leukosit, Penyakit Jantung Koroner, Penyumbatan Jantung, Stenosis, Prediktor.

PD-010

Integrated Bioinformatics Analysis of Differentially Expressed Genes and Pathways in Pulmonary Arterial Hypertension and Alzheimer's Disease

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Background: Pulmonary arterial hypertension (PAH) and Alzheimer's disease (AD) are both progressive disorders prevalent in older individuals. While AD is caused by accumulation of amyloid-beta plaques, PAH results from a heart condition leading to sustained precapillary hypertension. Despite different clinical features, both diseases share common underlying mechanisms such as vascular dysfunction, chronic inflammation, and hypoxia. However, the precise molecular pathways and shared differentially expressed genes (DEGs) driving their progression remain poorly understood.

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Objective: This study aims to uncover potential diagnostic biomarkers or therapeutic targets linking these conditions.

Methods: Two datasets (GSE193776 and GSE255982) from the GEO database were analyzed using the GEO2R tool to identify their DEGs. The overlapping DEGs were then found using Interactivenn and their biological functions and pathways established through KEGG/GO pathway analysis conducted with Enrichr. Lastly, a protein-protein interaction (PPI) network was constructed using Cytoscape and found the top 10 most significant genes using the CytoHubba plugin.

Results: Analysis revealed 11 upregulated and 109 downregulated DEGs. The upregulated genes were associated with negative regulation of glial cell proliferation, microbody membrane, acetylcholine receptor inhibitor activity. In contrast, downregulated genes were involved in response to interferon-alpha, collagen-containing extracellular matrix, and cytokine receptor activity. Pathway analysis indicated a connection to peroxisome for the upregulated genes and amoebiasis for the downregulated genes. Additionally, the PPI and CytoHubba analysis identified 10 hub genes: FN1, MMP2, COL1A1, COL3A1, BGN, HSPG2, FBN1, VCAN, CXCL12, FGF7.

Conclusion: Key hub genes and shared pathways have been identified which may help explain common molecular mechanisms underlying PAH and AD.

Keywords: *pulmonary arterial hypertension, Alzheimer's disease, bioinformatics*

PD-011

Explainable Machine Learning for Quality-of-Life Risk Stratification: A Road to Personalized Hypertension Care

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ABSTRACT

Background: Reduced quality of life (QoL) is common among individuals with hypertension and varies across physical and psychological domains. Explainable machine learning (ML) offers an opportunity to support personalized hypertension care by enabling domain-specific risk stratification and prioritization of modifiable determinants of poor QoL.

Objective: To apply explainable ML to support domain-specific risk stratification of reduced QoL in hypertension, and to identify modifiable determinants relevant for personalized hypertension care.

Methods: Data from hypertensive individuals (n = 534) completed WHOQOL BREF, Quick Physical Activity Rating, Morisky Medication Adherence Scale 8, and standardized questionnaires for acceptance and knowledge were analyzed utilizing XGBoost, Gradient Boosting, Random Forest, AdaBoost, Naive Bayes, and Decision Tree ML classifiers. The trained ML algorithms were evaluated using stratified 10-fold cross-validation, where the stability was examined using rank-

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based metrics. Shapley additive explanations (SHAP) were applied to the most stable model to interpret predictor contributions.

Results: For physical QoL, Random Forest (AUC 0.847; sensitivity 0.839; specificity 0.731) and Gradient Boosting (AUC 0.844; sensitivity 0.801; specificity 0.757) showed good reduced QoL identification. For psychological domain, best classifications were obtained from Gradient Boosting performed best (AUC 0.823; sensitivity 0.824; specificity 0.640) and XGBoost (AUC 0.821; sensitivity 0.811; specificity 0.661), with the former observed as the most stable. SHAP analysis identified acceptance and medication adherence as the dominant shared drivers of risk across both quality-of-life domains. Physical QoL risk was further influenced by physical activity-related factors, whereas Psychological QoL risk showed additional contributions from age and educational attainment.

Conclusion: Ensemble tree-based classifiers, particularly Gradient Boosting, provided balanced discrimination and consistent performance across domains, supporting their utility for screening and risk stratification. Acceptance and medication adherence emerged as the most influential shared drivers of risk, while physical activity, age, and educational attainment contributed to domain-specific heterogeneity.

Keywords: *Gradient boosting; ensemble tree; SHAP; risk stratification; outcomes*

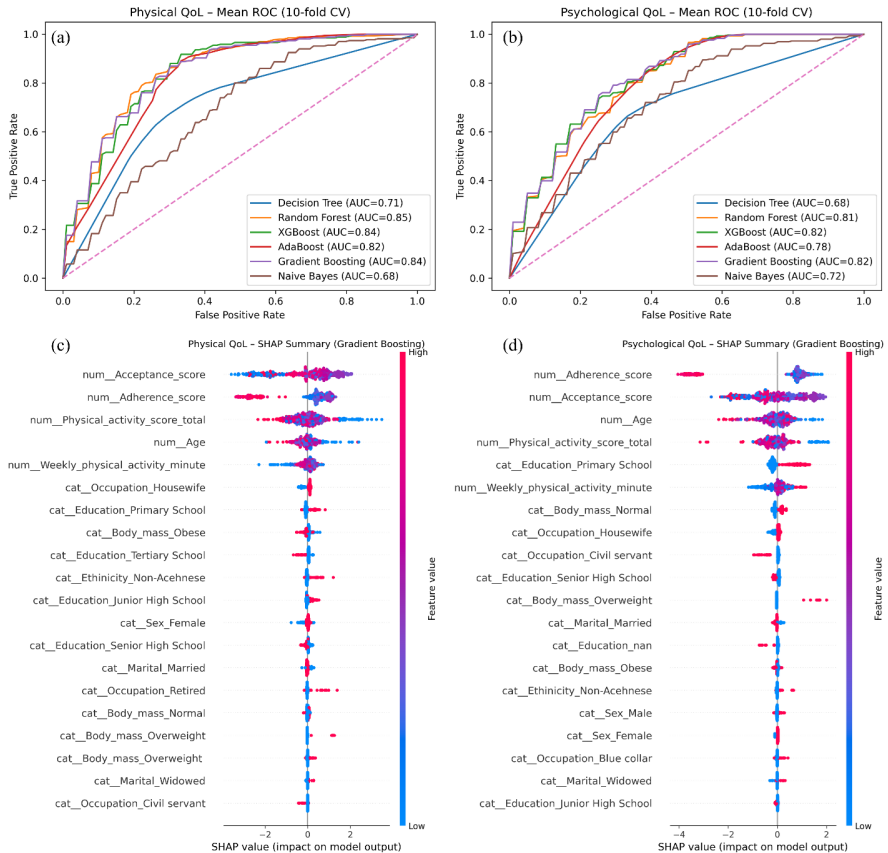


Figure 1. Mean ROC curves from stratified 10-fold cross-validation for machine learning models predicting reduced Physical (a) and Psychological (b) quality of life, and SHAP summary plots for the Gradient Boosting model illustrating key contributors to Physical (c) and Psychological (d) quality-of-life risk.

Synergistic Effects of Stingless Bee Honey and Structured Exercise on Glycemic Control, Lipid Profile, and Microalbuminuria in Type 2 Diabetes Mellitus Patients: A Randomized Controlled Trial

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Background: Type 2 diabetes mellitus (T2DM) remains a major health challenge, with 40-50% of patients failing to achieve target HbA1c levels using conventional therapy. Stingless bee honey (*Trigona* spp.) contains bioactive compounds with potential antidiabetic properties.

Objective: To evaluate the effectiveness of combining stingless bee honey with structured exercise on glycemic control, lipid profiles, and microalbuminuria in T2DM patients.

Methods: A 12-week double-blind, placebo-controlled randomized controlled trial was conducted at Mitra Utama Medika Clinic, Subang, Indonesia (July-November 2025). Eight T2DM patients aged 45-65 years with HbA1c 5-9% and BMI 23-35 kg/m² completed the study. Participants received stingless bee honey 20-25 g/day combined with structured exercise (150 minutes/week moderate-intensity aerobic exercise plus resistance training 2-3 times/week). Primary outcomes included HbA1c, fasting plasma glucose, 2-hour post-prandial glucose, lipid profile, and urinary microalbumin. Metabolomic analysis using liquid chromatography-mass spectrometry identified bioactive compounds.

Results: Ten major bioactive compounds were identified: 6 flavonoids (chrysin, apigenin, kaempferol, rutin, pinocembrin, naringenin) and 4 phenolic acids (gallic acid, caffeic acid, p-coumaric acid, sinapic

acid). After 12 weeks, significant improvements were observed in HbA1c ($8.19 \pm 2.06\%$ to $6.92 \pm 1.91\%$, 15.5% reduction) and post-prandial glucose (224.00 ± 88.39 mg/dL to 191.71 ± 102.17 mg/dL). Several subjects demonstrated improvements in lipid profiles with reductions in total cholesterol, LDL, and triglycerides, alongside increases in HDL. Microalbuminuria levels significantly decreased after 12 weeks of intervention.

Conclusion: Combined stingless bee honey and structured exercise demonstrates potential as an effective, safe, and cost-effective adjuvant therapy for improving glycemic control, lipid metabolism, and reducing microalbuminuria in T2DM management.

Keyword : Type 2 diabetes mellitus, stingless bee honey, *Trigona* spp., physical exercise, lipid profile, glycemic control, HbA1c, microalbuminuria, randomized controlled trial, metabolomics, adjuvant therapy

PD-013

Hypertension and the Silent Decline of Kidney Function in Indonesia: Insights From a Multicenter Primary Care Study

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Abstract

Introduction: Hypertension is a major contributor to chronic kidney disease (CKD) in Indonesia, accounting for 11.5% of kidney failure and

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present as a comorbidity in 74.5% of patients. However, data on CKD development and progression among hypertensive individuals remain limited. This study aimed to assess CKD incidence and determinants, evaluate kidney function progression, and determine CKD screening efficiency in a hypertensive population.

Methods: This multicentre cross-sectional study was conducted in 14 primary care centres in Jakarta. Adults aged >18 years with hypertension were included. Exclusion criteria were kidney replacement therapy, pregnancy, cognitive impairment, language barriers, or refusal to consent.

Results: A total of 645 participants were enrolled with a median age of 57 years (IQR 50–65); 74.6% were female. Most participants were obese (77.8%), and 48% had controlled blood pressure. RAS inhibitors were prescribed in only 21%. CKD prevalence was 13.3% with an incidence rate of 8.8 per 100 person-years and a number needed to screen of 8. Older age (OR 18.4, 95% CI 2.2–152.9) and smoking (OR 3.4, 95% CI 1.1–10.9) were significantly associated with CKD development. In a linear mixed-effects model, baseline eGFR was 85.3 ± 9.6 mL/min/1.73 m², with a non-significant annual decline of 9.5 ± 8.9 mL/min/1.73 m². Younger age and female sex were associated with lower baseline eGFR but slower decline over time.

Conclusions: CKD burden is high among hypertensive individuals, with elevated risk of kidney function decline overtime. This study underscore the importance of early screening and optimization of chronic disease management in this population.

PD-014

Ensemble Machine Learning for Risk Stratification of Uncontrolled Hypertension Among Married Women: Analysis on Indonesian Health Survey 2023

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Abstract

Background: Uncontrolled hypertension remains a major public health concern among women of reproductive age, increasing the risk of adverse maternal outcomes. Machine learning (ML) offers a scalable framework for risk stratification using routinely collected population data.

Objective: To develop and evaluate ensemble ML models for identifying individuals at risk of uncontrolled hypertension among married women, and to quantify model performance using clinically relevant diagnostic metrics.

Methods: A population-based ML analysis was conducted using data from the 2023 Indonesian National Health Survey (SKI), including 86,364 women of reproductive age living with their spouses. Uncontrolled hypertension was defined as mean systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg. Predictors encompassed age, hypertension duration, medication use and follow-up, physical activity, household smoking exposure, dietary indicators, and anthropometric

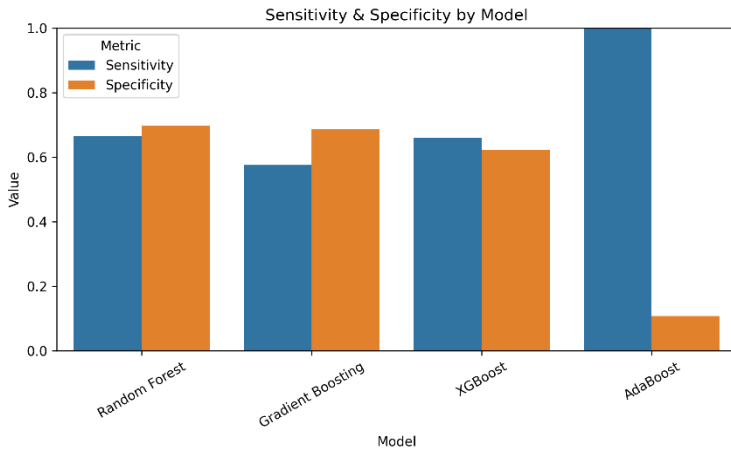
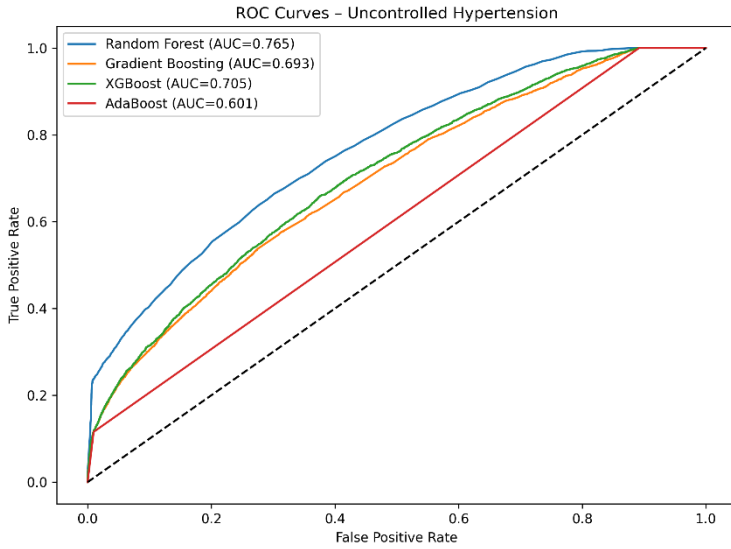
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measures. The dataset was partitioned into training (70%, $n = 60,454$) and test (30%, $n = 25,910$) sets. Ensemble classifiers—Random Forest, Gradient Boosting, XGBoost, and AdaBoost—were trained and evaluated. Model performance was assessed using area under the receiver operating characteristic curve (AUC), F1 score, sensitivity, and specificity, with classification thresholds optimized using Youden's index.

Results: The prevalence of uncontrolled hypertension was 17.4%. Among evaluated models, Random Forest demonstrated the strongest overall performance (AUC = 0.765; sensitivity = 0.665; specificity = 0.698; F1 = 0.430), followed by XGBoost (AUC = 0.705) and Gradient Boosting (AUC = 0.693). AdaBoost achieved maximal sensitivity (1.000) but showed poor specificity (0.108), limiting its utility. These findings indicate that ensemble tree-based models can achieve moderate discrimination while maintaining balanced sensitivity and specificity for population-level screening.

Conclusion: Ensemble machine learning models, particularly Random Forest, enable effective risk stratification of uncontrolled hypertension among married women using routinely collected survey data. This approach supports the development of data-driven screening tools to inform targeted hypertension management and preventive strategies at the population level.

Keywords: Decision tree; ensemble tree; random forest; hypertension; maternal complication.



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PD-015

THE ROLE OF INTRADIALYTIC AEROBIC EXERCISE ON PREDIALYSIS AND POSTDIALYSIS BLOOD PRESSURE IN CHRONIC KIDNEY DISEASE PATIENTS UNDERGOING ROUTINE HEMODIALYSIS

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ABSTRACT

Background: Chronic Kidney Disease confers a consequential burden of cardiovascular disease especially in hemodialysis patients. Blood pressure instability in hemodialysis patients is common, reflecting impaired autonomic and vascular regulation, contributing to adverse outcomes. Intradialytic aerobic exercise is a feasible non-pharmacological strategy to improve hemodynamic control for hemodialysis patient, however evidence from routine clinical settings remains limited.

Objective: To evaluate the impact of intradialytic aerobic exercise on blood pressure in patients undergoing regular hemodialysis.

Methods: Interventional single group pre and post test study with consecutive sampling on hemodialysis patients receiving aerobic intradialytic exercise using ergometer for 8 weeks were conducted. Blood pressure was recorded before and after hemodialysis session. Paired statistical tests were selected according to data distribution, with p value <0.05 considered significant.

Results: Of 537 hemodialysis patients screened, 31 completed the study. Eight weeks of intradialytic aerobic exercise, shows significant reduction of predialysis systolic blood pressure by a mean of 10.6 mmHg (95% CI, 8.4 to 12.9; $P < 0.001$), and predialysis diastolic blood pressure by 5.1 mmHg (95% CI, 1.9 to 8.4; $P = 0.03$). Postdialysis systolic blood pressure declined by 10.6 mmHg (95% CI, 8.1 to 13.2; $P < 0.001$). Postdialysis diastolic blood pressure also decreased significantly ($P < 0.001$). No serious adverse events were observed.

Conclusion: Intradialytic aerobic exercise revealed significant reduction of pre-post dialysis blood pressure in hemodialysis patients, suggesting improvement of hemodynamic control; highlighting a role as nonpharmacologic adjunct to standard care. However further studies with larger sample sizes and controlled designs are warranted to assess long term clinical outcomes.

Keywords: Chronic kidney disease, Hypertension, Pre dialysis blood pressure, Post dialysis blood pressure, Hemodialysis.

PD-016

Intradialytic Blood Pressure Variability and Subclinical Left Ventricular Dysfunction in Hemodialysis Patients with Intradialytic Hypertension: A Retrospective Cohort Study

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Background: Intradialytic hypertension is common in maintenance hemodialysis and may contribute to myocardial injury despite preserved left ventricular ejection fraction. Intradialytic blood pressure variability

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may capture hemodynamic instability beyond mean blood pressure. Global longitudinal strain can detect subclinical left ventricular systolic dysfunction earlier than conventional measures.

Aim: To evaluate the association between intradialytic blood pressure variability and subclinical left ventricular dysfunction in hemodialysis patients with intradialytic hypertension.

Method: A retrospective cohort study was conducted in January to February 2025 among adult hemodialysis patients with intradialytic hypertension and preserved ejection fraction. Systolic and diastolic blood pressure were recorded during each hemodialysis session over one month with 8 sessions. Variability indices including standard deviation, coefficient of variation, and average real variability were calculated for each session and averaged across sessions. Echocardiography including speckle tracking GLS and other parameters was performed in week 5 on a non-dialysis day by a board-certified internist cardiologist. Subclinical left ventricular dysfunction was defined as reduced GLS greater than -15.9% . Group comparisons used Mann Whitney tests. Multivariable logistic regression adjusted for demographic, clinical, dialysis-related, and laboratory factors.

Result: Eighty-six patients were included with mean age 52.26 ± 7.20 years and 47.7% men. Reduced GLS occurred in 46 of 86 patients, or 53.5%. Reduced GLS was associated with higher LV end systolic volume and LV internal diameter in systole, while age, sex, comorbidities, biochemistry, and other echocardiographic parameters were similar. Systolic variability was higher in reduced versus normal GLS, including SD 14.36 vs 11.93 ($p=0.013$), CV 8.82 vs 7.58 ($p=0.019$), and ARV 12.6 vs 9.3 ($p=0.009$). Diastolic variability indices were not different. Higher ARV-SBP remained independently associated with reduced GLS after adjustment with aOR 2.33 (95%CI 1.31 to 5.55).

Conclusion: Greater intradialytic systolic blood pressure variability over one month is independently associated with subclinical left ventricular dysfunction in hemodialysis patients with intradialytic hypertension and preserved ejection fraction.

Keywords: Intradialytic Blood Pressure Variability, Intradialytic Hypertension, Global Longitudinal Strain, Hemodialysis

References:

1. Fu YT, Tseng CH, Huang WM, Yu WC, Cheng HM, Chiang CE, Chen CH, Sung SH, Lin CC. Prognostic impacts of left ventricular strain in hemodialytic patients with preserved left ventricular systolic function. *Scientific reports*. 2025 Jul 9;15(1):24723.
2. Flythe JE, Inrig JK, Shafi T, Chang TI, Cape K, Dinesh K, Kunaparaju S, Brunelli SM. Association of intradialytic blood pressure variability with increased all-cause and cardiovascular mortality in patients treated with long-term hemodialysis. *American journal of kidney diseases*. 2013 Jun 1;61(6):966-74.

PD-017

Artificial Intelligence–Enabled Digital Health Programs for Hypertension Management: Effectiveness of Telemonitoring and Automated Lifestyle Coaching on Blood Pressure Control and Adherence

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Komando Sektor III

Background: Hypertension control remains suboptimal, driven by limited clinic time, therapeutic inertia, and poor adherence. Home blood pressure (BP) monitoring and telehealth can improve outcomes, yet personalization and sustained engagement remain challenging. Artificial intelligence (AI)–enabled digital programs may strengthen remote hypertension care by automating risk stratification, feedback, reminders, and tailored lifestyle coaching.

Objective: To evaluate whether an AI-enabled program combining BP telemonitoring with automated lifestyle coaching improves BP control and adherence versus usual care.

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Method: A pragmatic, parallel-group randomized controlled trial will enroll adults with uncontrolled hypertension in outpatient care. Participants will be randomized 1:1 to an AI-enabled intervention or usual care for 6 months. The intervention includes validated home BP devices with automatic data transmission, algorithm-triggered alerts for persistent BP elevation, automated individualized coaching (dietary sodium reduction, physical activity, weight management, and sleep hygiene), medication reminders, and clinician dashboards to support timely treatment review. The primary outcome is change in mean systolic BP at 6 months using standardized home BP averages (or ambulatory BP where available). Secondary outcomes include BP target attainment, adherence measures, engagement metrics, patient satisfaction, and healthcare utilization.

Result: The study will estimate the intervention's effect on systolic BP reduction and target attainment and assess associations between engagement, adherence, and BP response.

Conclusion: AI-enabled telemonitoring with automated coaching may offer a scalable approach to improve BP control and adherence within routine multidisciplinary care.

Keyword: Hypertension; artificial intelligence; telemonitoring; mobile health; medication adherence.

PD-018

The Pressure Chronicles: Blood Pressure Control in a Dual-Hit Hypertensive–Diabetic Rat Model

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Background : Diabetes mellitus is a metabolic disorder characterized by persistent hyperglycemia resulting from impaired insulin secretion, action, or both (Goyal et al., 2023). Hypertension is a key risk factor for diabetes, with hypertensive individuals exhibiting a two- to three-fold greater likelihood of developing the disease. The coexistence of these conditions accelerates diabetic complications and increases cardiovascular morbidity and mortality (Epstein & Sowers, 1992). Their interaction involves dysregulation of the autonomic nervous system, overactivation of the renin–angiotensin–aldosterone system (RAAS), maladaptive immune responses, and environmental influences (Naha et al., 2021). To model this complex pathology, a sub-nephrectomized hypertensive rat with experimentally induced diabetes is frequently employed. The model is established by surgical removal of five-sixths of renal tissue and induction of diabetes using intraperitoneal streptozotocin (60 mg/kg) combined with nicotinamide (110 mg/kg), providing a clinically relevant platform to study hypertension–diabetes interactions and potential therapies. This model aims to examine the impact of blood pressure variations on diabetic rat models with hypertension subnephrectomy.

Methods : A controlled pre- and post-test experimental approach was applied, evaluating blood pressure changes between normotensive rats (pre-test) and those rendered hypertensive with type 2 diabetes (post-test). Data were analyzed with a paired t-test.

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Result : Significant increases were detected in both systolic ($p = 0.006$) and diastolic ($p = 0.005$) blood pressure after the intervention. Mean arterial pressure also differed significantly between pre- and post-test measurements ($p = 0.005$).

Conclusion : The findings demonstrate that experimental induction of hypertension and type 2 diabetes mellitus in rats leads to a significant elevation in systolic, diastolic, and mean arterial pressures. These results confirm the effectiveness of the model in producing measurable hemodynamic changes and support its use for evaluating therapeutic interventions targeting blood pressure regulation.

Keyword : blood pressure, diabetic rat, hypertensive

PD-019

Hyperuricemia as an Independent Predictor of Hypertension: A Large-Scale Cohort Study

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Background: The role of hyperuricemia in the pathogenesis of hypertension remains a subject of debate. While often associated with cardiovascular disease, it is frequently considered a mere bystander to other metabolic risk factors—such as obesity and renal dysfunction—rather than a direct contributor to vascular stiffness.

Objective: This study aimed to investigate whether serum uric acid levels constitute an independent predictor of hypertension after adjusting for body mass index (BMI), diabetes status, and renal function in a large-scale cohort.

Method: We analyzed data from a cohort of approximately 170,000 subjects. A multivariate binary logistic regression analysis was performed to determine the association between serum uric acid levels (IV) and hypertension status (DV). The model was adjusted for key potential confounders, including BMI, diabetes mellitus status, and serum creatinine levels.

Result: The analysis revealed that serum uric acid is a significant independent predictor of hypertension. After adjusting for confounders, every 1 mg/dL increase in uric acid was associated with a 12.6% increase in the odds of developing hypertension (OR 1.126; 95% CI 1.110–1.142). This association remained robust and statistically significant independent of BMI and renal function, which were also identified as strong predictors in the model.

Conclusion: Hyperuricemia is independently associated with an increased risk of hypertension, distinct from the effects of obesity and renal function. These findings suggest that uric acid may play a direct role in blood pressure regulation and should be considered a relevant independent marker in cardiovascular risk stratification.

Keywords: Hyperuricemia; Hypertension; Serum uric acid; Logistic regression.

Poster

PD-020

BIOINFORMATICS ANALYSIS OF DIFFERENTIALLY EXPRESSED GENES IN PULMONARY HYPERTENSION DUE TO LEFT HEART DISEASE

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Background: Pulmonary hypertension (PH) due to left heart disease (LHD) is the most common type of PH. Its pathophysiology is complex and the underlying molecular mechanisms remain incompletely understood. Currently, there are no specific biomarkers that available to detect PH due to LHD.

Objective: This study aims to identify differentially expressed genes (DEG) as potential biomarkers to detect PH due to LHD.

Methods: An in silico analysis was performed with RNA-seq datasets (GSE236251). GEO2R was used to identify the upregulated and downregulated DEGs. A Venn diagram was created to find the DEGs. These genes were analyzed with Enrichr for the Gene Ontology and Kyoto Encyclopedia of Genes and Genomes. A PPI network was created in Cytoscape and the top 10 hub genes were ranked using Cytohubba.

Results: The analysis shows that 206 genes were differentially expressed, 35 of them were upregulated, and 171 were downregulated. The upregulated genes were associated with regulation of TLR by endogenous ligand and RHO GTPases activate NADPH oxidases. The downregulated genes were associated with primary bile acid biosynthesis and chemokine signaling pathway. The PPI network displayed 137 genes with 18 connections. The top 10 hub genes ranked: CXCL11, CCL21, PPBP, CXCL8, TNF, CXCL3, CCL24, TNFAIP6, and BIRC3.

Conclusion: PH due to LDH can potentially occur through several different pathways and mechanisms of the DEG. The top 10 hub genes ranked CXCL11, CCL21, PPBP, CXCL8, TNF, CXCL3, CCL24, TNFAIP6, and BIRC3. Further studies should be done on patients or for its potential use as a drug target.

PD-021

BIOINFORMATICS ANALYSIS ON THE RELATIONSHIP BETWEEN OBESITY AND HYPERTENSION

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Background: Hypertension is a form of metabolic disorder characterized with an increased systolic and diastolic blood pressure. Currently, this condition is worsened in obese people with 60-75% of obese people have hypertension. Several studies have been conducted to identify the relationship between hypertension and obesity. But, research specifically on obese people with no hypertension hasn't been done.

Objective: This study aims to identify the molecular mechanism why most obese people have hypertension compared with obese people that don't have hypertension.

Methods: A bioinformatics analysis was performed with one dataset regarding obese patients with and without hypertension from GEO: (GSE217007). Following that, the GEO2R tool was used to identify the upregulated and downregulated differentially expressed genes (DEG). These genes were then analyzed with Enrichr for the gene ontology and pathway enrichment.

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Results: From the analysis done, 56 genes were differentially expressed, 23 of them were upregulated, and 33 were downregulated. The upregulated genes were associated with synthesis of eicosaentric acid, regulation of small metabolic process, and phospholipase activity. The downregulated genes were associated with chemokine binding, secretory granule lumen, and dynactin binding.

Conclusion: The mechanism of obese patients with hypertension can be explained through the molecular mechanisms identified. It is recommended that future studies be done with more patients or in vitro.

PD-022

Integrated Bioinformatics Analysis of PM2.5 Exposure Alters Sodium Homeostasis via SCNN1G Dysregulation in male patient: Implications for Hypertension Pathogenesis

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Background: Hypertension is significantly associated with PM2.5 exposure, contributing to approximately 20-25% of the global hypertension burden. Global PM2.5 concentrations have risen 8-10% (2010-2019), with 2-3 fold increases in industrializing regions. Males demonstrate 1.3-1.5 times higher hypertension risk and 15-25% greater blood pressure responsiveness to PM2.5 than females. The mechanism of PM2.5 exposure leading to hypertension in this vulnerable population is a critical research topic with implications for environmental health policy and precision medicine.

Objective: To analyze the molecular mechanisms through which PM2.5 exposure contributes to hypertension pathogenesis specifically in male patients.

Methods: Two transcriptomic datasets from male populations were obtained from the Gene Expression Omnibus (GEO) database: GSE24752 (PM2.5 exposure study) and GSE7010 (hypertension study) were analyzed using GEO2R to identify common upregulated DEGs ($|\log_2FC| > 0.5$, adj. $p < 0.05$). Enrichment analysis via Enrichr assessed GO terms and KEGG pathways. Protein-protein interaction networks were constructed with STRING-db and visualized in Cytoscape to identify hub genes by degree centrality.

Results: Identified 34 common upregulated genes significantly enriched in aldosterone-regulated sodium reabsorption (KEGG 2021 Human, $p < 0.05$) and showed strong association with biological processes including renal system development, cardiac chamber morphogenesis, and response to hypoxia. Network analysis revealed SCNN1G, SGK3, PRKCG, and ATXN3 as hub genes, with SCNN1G (sodium channel) as the primary hub.

Conclusion: PM2.5 exposure disrupts blood pressure regulation in males through SCNN1G-mediated sodium homeostasis disruption, explaining their environmental hypertension susceptibility.

Keywords: *Bioinformatics; hypertension; PM2.5; air pollution; male susceptibility.*

PD-023

Nocturnal Hypertension Among Patients Undergoing ABPM at General Hospital Bogor 2024- 2025

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Nocturnal hypertension is defined as an increase in systolic blood pressure (SBP) > 120 mmHg and diastolic blood pressure (DBP) > 70 mmHg at night. Nighttime blood pressure decreases by approximately

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10–20% due to reduced sympathetic activity and increased vagal tone. However, several factors can cause an elevation in nighttime BP, including high salt intake, salt sensitivity, obstructive sleep apnea, and diabetes mellitus. Nocturnal hypertension is considered a form of masked hypertension and is often misdiagnosed because patients may have normal BP in work office. Home blood pressure monitoring is insufficient to capture nighttime BP fluctuations; therefore, ambulatory blood pressure monitoring (ABPM) is recommended for accurate diagnosis.

This study aims to characterize of nocturnal hypertension in patients undergoing diagnostic or therapeutic evaluation, as assessed by ambulatory blood pressure monitoring (ABPM).

This study used a descriptive analytical design with a retrospective cross-sectional approach. The research was conducted at the Regional General Hospital Bogor to evaluate blood pressure variability and diagnosis.

The results are a total sample of 43 patients, with 58.1% male patients and the average age group for hypertension being 36-54 years old at 72.1%. The diagnoses obtained from the ABPM results were sustained hypertension (65.1%), isolated nocturnal hypertension (16.3%), controlled hypertension (16.3%), and normotension (2.3%). The average dipper rhythm in no dippers was 46.5%. Among the 15 in the sustained hypertension group, 3 have INH, and 2 have controlled hypertension.

In this study, nocturnal hypertension was more prevalent in patients with sustained hypertension, followed by those with isolated nocturnal hypertension (INH) and controlled hypertension. This pattern of nocturnal hypertension is associated with two time an increased risk of cardiac complications.

PD-024

CORRELATION BETWEEN INFARCT AND ISCHEMIC ECG PATTERNS AND DEGREE OF STENOSIS BASED ON VESSEL DISEASE, GENSINI SCORE OF CORONARY ARTERY IN PATIENTS WITH HEART DISEASE**Ali Sofyan Maulidi¹, Muhammad Saugi Abduh²**

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ABSTRACT

Introduction: Coronary heart disease (CHD) continues to be the primary cause of mortality across the globe [1]. This condition develops due to the accumulation of atherosclerotic plaques in the coronary arteries, which can trigger Acute Coronary Syndrome (ACS), including STEMI, NSTEMI, and unstable angina [2]. Electrocardiogram (ECG) findings can reflect myocardial ischemia or infarction depending on the severity of coronary artery narrowing [3].

Methods: An analytic observational study was conducted using medical record data from CHD patients who underwent follow-up ECG examinations and coronary angiography at Sultan Agung Hospital between January 2018 and December 2023. Bivariate and multivariate statistical analyses were applied.

Results: A significant correlation was found between infarct ECG patterns and degree of stenosis ($p=0.02$). the most influential risk factors were DM($p=0.024$), Sex($p=0.001$), Obesity($p=0.096$)

Conclusion: There is an association between infarction/ischemic ECG patterns and the severity of stenosis in CHD. Risk factors such as

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diabetes, sex, and obesity may influence the progression of stenosis, thereby emphasizing the importance of early detection to prevent complications.

Keywords: Infarction; Ischemic; Degree Of Stenosis; Gensini score; Signifikans non signifkans

References

1. Vaduganathan, M. et al. (2022) 'The Global Burden of Cardiovascular Diseases and Risk: A Compass for Future Health', *Journal of the American College of Cardiology*, 80(25), pp. 2361–2371. doi:10.1016/j.jacc.2022.11.005.
2. Leonard, LS (2019) *Pathophysiology of Heart Disease, Sustainability (Switzerland)*. Available at: <http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017>
3. Thaler, M. s (2019) *The Only ECG BOOK You'll Ever Need*, 9 Edition

PD-025

Not All Hypertension Is the Same: Multimorbidity Phenotypes and Hospitalization Risk From 2024 BPJS Claims

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Background: Hypertension frequently coexists with multiple chronic conditions, yet patients with the same blood pressure diagnosis often experience markedly different clinical trajectories. Understanding patterns of multimorbidity among patients with hypertension using contemporary real-world data may help identify subgroups at higher risk.

Objective: To identify multimorbidity phenotypes among patients with hypertension and evaluate their association with inpatient referral and hospitalization risk.

Methods: We analyzed 2024 BPJS Kesehatan claims data to identify adult patients with hypertension using ICD-10 codes I10–I15. Diagnoses were aggregated at the patient level and used to construct a weighted disease co-occurrence network. To focus on stable and common relationships, diagnoses with low prevalence and weak co-occurrence were excluded. Louvain community detection was applied to identify multimorbidity phenotypes. Each patient was assigned to a dominant phenotype based on their diagnosis profile. Inpatient FKRTL care was defined at the patient level as having at least one inpatient referral during the study period. Logistic regression was used to examine the association between phenotype and inpatient.

Results: A total of 89,168 patients with hypertension were included. The multimorbidity network consisted of 82 diagnoses forming a single connected system. Five clinically interpretable phenotypes were identified: general/low-complexity, metabolic–renal, cardiovascular, neurovascular, and ophthalmologic. Overall, 28.3% of patients experienced inpatient FKRTL care. Hospitalization risk varied substantially by phenotype, ranging from 18.5% in the ophthalmologic phenotype to 61.6% in the neurovascular phenotype. Compared with the general phenotype, odds of inpatient care were higher in the metabolic–renal (OR 3.83, 95% CI 3.63–4.05), cardiovascular (OR 2.43, 95% CI 2.31–2.55), and neurovascular phenotypes (OR 5.04, 95% CI 4.52–5.62).

Conclusion: Among patients with hypertension, multimorbidity phenotypes derived from routine claims data identify subgroups with two- to five-fold differences in hospitalization risk. These findings suggest that incorporating comorbidity patterns, rather than hypertension alone, may support more clinically meaningful risk stratification and prioritization of care in hypertensive patients.

Keywords: *Hypertension; multimorbidity; disease networks; hospitalization risk; claims data.*

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PD-026

Determinants of Hypertension Adherence at Brati Primary Health Care: Education, Socioeconomic Status, Health Care Access

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ABSTRACT

Background: Medication adherence is a major challenge in hypertension management and may be influenced by educational attainment, socioeconomic status, and health care access in primary care settings.

Objective: This study evaluated the association between educational attainment, socioeconomic status, health care access, and medication adherence among hypertensive patients at Brati Primary Health Care.

Methods: Cross-sectional study was conducted from March to April 2025 involving 120 hypertensive patients. Blood pressure was measured to assess control status, and medication adherence was evaluated using the validated Medication Adherence Report Scale (MARS-5). Educational attainment was classified according to the highest level of formal education completed. Socioeconomic status was assessed using a structured questionnaire covering income, occupation, and household assets. Health care access was defined as patients' self-reported ability to obtain medical consultations, prescriptions, and medication refills without financial or geographic barriers. Logistic regression analysis was applied to examine associations between medication adherence and independent variables, with subgroup analyses exploring interactions

between health care access and blood pressure outcomes.

Results: Mean age of participants was 53.5 ± 17.8 years. Mean systolic and diastolic blood pressures were 142.6 ± 20.6 mmHg and 90.1 ± 12.2 mmHg, indicating suboptimal control. Lower socioeconomic status was significantly associated with poorer medication adherence (OR: 0.62; 95% CI: 0.40–0.96; $p = 0.030$). Educational attainment and health care access were not significantly associated with adherence ($p > 0.05$). Subgroup analysis showed borderline association between health care access and systolic blood pressure ($p = 0.058$).

Conclusion: Socioeconomic disparities influence medication adherence; targeted low-income interventions may improve adherence and control.

Keywords: hypertension; medication adherence; educational status; socioeconomic factors; health care access.

PD-027

Risk Factors of Hypertension and the Incidence of Acute Coronary Syndrome Among the Police Advanced Development Program 2025. (PADP 2025) Students of the Indonesian National Police at Bhayangkara Hospital, Setukpa Lemdiklat Polri, Sukabumi, West Java, Indonesia

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Abstract

Background: Hypertension is a major risk factor for Acute Coronary Syndrome (ACS). Combined with high physical workload and psychological stress, hypertension may increase the risk of ACS among police officers. Students of the Indonesian National Police. Police Advanced Development Program (PADP) are generally middle-aged

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and involved in intensive physical activity, making them vulnerable to cardiovascular disorders.

Objective: To identify the characteristics, hypertension risk factors, and the relationship between cardiovascular risk factors and ACS incidence among students of the Indonesian National Police at Bhayangkara Hospital.

Methods: This descriptive cross-sectional study involved 219 POLICE ADVANCED DEVELOPMENT PROGRAM 2025 students undergoing medical examinations at Bhayangkara Hospital, Setukpa Sukabumi, from November to December 2025, selected by purposive sampling. Data were drawn from medical check-up, outpatient, and inpatient records. Univariate and bivariate analyses were performed using the Chi-square test with a 95% confidence level ($\alpha = 0.05$).

Results: ACS occurred in 3 male students (1.4%) aged over 45 years. Most subjects were aged 46–47 years (mean 47.6 years). The predominant risk factor was hypertension (82.2%), followed by overweight (42.0%) and hypercholesterolemia (20.5%). Age, hypertension, hypercholesterolemia, and overweight showed no significant association with ACS ($p > 0.05$). However, comorbid heart disease was significantly associated ($p = 0.003$), as all ACS cases had previous cardiac history.

Conclusion: Hypertension was the most common risk factor but was not significantly related to ACS incidence. Early screening for hypertension is essential for ACS prevention among PADP students.

Keywords: Acute Coronary Syndrome, risk factors, hypertension, cardiac comorbidity.

PD-028

Correlation of Hypertension Medication Coverage with Public Seeking Online Hypertension and Smoking-Related Information

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Background: The main hypertension management in Indonesia is still limited to curative management. Although internet use to search for health-related information is increasing, studies describing its impact on medication coverage in Indonesia are still limited.

Objective: To analyze the correlation between hypertension medication coverage and online information-seeking activities related to hypertension in West Java.

Method: This study used public open data on hypertensive population receiving treatment in West Java between 2019 and 2024. Analysis of hypertension-related health seeking information was conducted by searching data from Google Trends using keywords “obat hipertensi” + “terapi hipertensi” + “cara mencegah hipertensi” for hypertensive topic dan “merokok” + “bahaya merokok” for smoking topic with similar search time span. The data obtained were then analyzed using the Spearman correlation test with a p-value <0.05 indicating significance.

Result: Based on nine cities/regencies, Cimahi had a higher average coverage of hypertension treatment, higher public interest in hypertension and smoking topics (66.95±46.35%, 99.50±1.22 %, and 66.16±12.54 %, respectively) compared to the total average of all sampled cities/regencies (40.05±32.22%, 53.12±21.02 %, and 60.96±12.76 %, respectively). A negligible-weak correlation was found between hypertension medication coverage with the level of online public interest in hypertension (Spearman's rho = 0.024; p = 0.865) and smoking (Spearman's rho = 0.190; p = 0.169) or both topics (Spearman's rho = 0.231; p = 0.093).

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Conclusion: Hypertension management strategies still emphasize curative efforts, while hypertension literacy remains suboptimal in some areas. Innovative strategies are needed to elaborate synergies between promotive, preventive, and curative approaches to address hypertension in West Java.

Keywords: health information; hypertension; information seeking behavior; open data; smoking.

PD-029

Global Trends in Nocturnal Hypertension Research: A Bibliometric Study (1976 – 2026)

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Introduction: Nocturnal hypertension is a strong predictor of cardiovascular and renal outcomes and has gained attention with widespread use of ABPM. Despite its clinical relevance, the global research landscape and collaboration patterns in nocturnal hypertension remain insufficiently synthesized.

Objective: To map research trends, productivity, and global collaboration patterns in nocturnal hypertension using bibliometric analysis.

Methods: A bibliometric study was conducted using publications retrieved from Scopus database covering from 1976 to 2026. Relevant articles were identified using nocturnal hypertension-related keywords. Descriptive metrics, citation indicators, authorship patterns, and geographic distribution were analyzed using Bibliometrix (R) and VOSviewer. Key indicators included annual publication growth, citation performance, co-authorship networks, institutional, and country-level productivity.

Results: A total of 760 documents were identified, contributed by 3,882 authors and published across 295 sources. The annual publication growth rate was 1.4%, reflecting steady long-term scholarly interest. The Journal of Hypertension was the most productive and influential source (91 publications; h-index = 37). The most prolific authors were Kario K (47 publications), Mancina G (28), and Hoshida S (24). Jichi Medical University (52 publications) emerged as the leading institution. The United States, Japan, and Italy were the top contributing countries. The average citation per document was 34.12, indicating sustained academic impact. International co-authorship accounted for 19.21%, suggesting moderate global collaboration.

Conclusion: Nocturnal hypertension research represents a mature but geographically concentrated field characterized by steady growth and strong citation longevity. Limited international collaboration and underrepresentation of low- and middle-income regions highlight critical opportunities for future multinational research.

Keyword: Nocturnal hypertension; Bibliometric analysis; Research trend; Scopus.

PD-030**Tracing Inflammation to Mortality in Heart Failure with Evidence From Soluble Urokinase-Type Plasminogen Activator Receptor: A Systematic Review and Meta-Analysis**

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Background: Heart failure (HF) is one of the leading causes of morbidity and mortality. It is also associated with systemic inflammation and changes in inflammatory biomarker levels, such as soluble urokinase-type plasminogen activator receptor (suPAR).

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Objective: This systematic review and meta-analysis aimed to determine the association between baseline suPAR levels and mortality risk in patients with heart failure.

Methods: A systematic search of PubMed, Scopus, and SAGE was conducted until December 2025. Eligible studies reported suPAR and risk of mortality in HF patients. Data were pooled using a random-effects model to calculate hazard ratios (HR) with 95% confidence intervals (CI) per 1 standard deviation (SD) increment. Risk of bias was assessed using QUIPS tools. Evidence certainty was rated using GRADE assessment.

Results: A total of six cohort studies published between 2017 and 2024 were included, involving 5780 participants from Austria, France, New Zealand, Singapore, and the United States of America. The pooled analysis demonstrated that suPAR was a strong predictor of mortality in HF patients (HR = 1.50; 95% CI 1.19 to 1.89; $p = 0.0006$; $I^2 = 87\%$). Based on sensitivity analysis, suPAR was also significantly associated with mortality risk in patients with stable HF ($p = 0.007$). All studies were rated low to moderate risk of bias and the certainty of the outcome was high.

Conclusion: Elevated suPAR levels are significantly associated with increased mortality risk in patients with heart failure, providing prognostic utility in clinical practice.

Keywords: Heart failure; suPAR; mortality.

PD-031

Efficacy, Dose Response, and Safety of Aldosterone Synthase Inhibitors as A Novel Antihypertensive Strategy A Systematic Review and Meta-Analysis

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Background: Aldosterone plays a key role in blood pressure (BP) regulation. Aldosterone synthase inhibitors (ASIs) targeting CYP11B2, represent a novel therapeutic option for hypertension, but their clinical efficacy and safety remain uncertain.

Objective: This systematic review and meta-analysis aims to evaluate the antihypertensive efficacy and safety of ASIs and to assess treatment effects according to drug type and dosage.

Methods: PubMed and Scopus were searched in accordance with PRISMA guidelines for RCTs published up to January 19, 2026, comparing aldosterone synthase inhibitors with placebo in patients with hypertension. Primary outcomes were changes in systolic and diastolic blood pressure (SBP and DBP). Data were synthesized using least-squares mean differences (LSMDs) with 95% confidence intervals (CIs). Study quality was assessed using the Cochrane Risk of Bias 2 tool, and analyses were conducted using RevMan 5.4.

Results: Nine RCTs involving 3,572 patients were included. Overall, ASIs were associated with significant reductions in both SBP and DBP compared with placebo. Baxdrostat demonstrated the greatest SBP reduction (LSMD, -8.38 mmHg; 95% CI, -9.94 to -6.83; $P < 0.001$), with the largest effect observed at high doses (LSMD, -9.24 mmHg; 95% CI, -11.53 to -6.95; $P < 0.001$). In contrast, showed the strongest

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DBP reduction (LSMD, -6.11 mmHg; 95% CI, -8.85 to -3.37; $P < 0.001$), with the 2-mg dose identified as the most effective regimen (LSMD, -9.20 mmHg; 95% CI, -14.65 to -3.75; $P < 0.001$). However, subgroup analyses across all agents stratified by different dosage levels revealed no statistically significant differences between subgroups ($P > 0.05$). Regarding safety outcomes, adverse events, including hyperkalemia, hypotension, and hyponatremia, were significantly associated with ASI therapy when compared to placebo.

Conclusions: Selective ASIs provide clinically meaningful blood pressure reduction with an acceptable safety profile in patients with hypertension. However, the elevated risk of adverse events needs careful patient selection and close biochemical monitoring. Larger, long-term RCTs are required to establish their sustained efficacy and safety.

Keywords: *Aldosterone synthase inhibitors; Hypertension; Efficacy; Adverse events.*

PD-032

Guiding the Breath to Reduce the Pressure: Evaluating Device-Guided Breathing as an Adjunct Therapy in Hypertension - A Systematic Review and Meta-Analysis of Randomized Clinical Trials

ABSTRACT

Introduction: Hypertension is a leading modifiable driver of cardiovascular morbidity and premature mortality, and cardiovascular diseases remain the top global cause of death. In 2024, an estimated 1.4 billion adults aged 30 to 79 years lived with hypertension, yet only just over one in five had their blood pressure under control, underscoring the urgency for scalable adjunct strategies beyond usual lifestyle advice and medication. Device guided breathing uses biofeedback to slow respiration and may reduce sympathetic tone, but trial findings on

blood pressure outcomes are inconsistent.

Objectives: To evaluate the efficacy of device guided breathing on blood pressure and heart rate in adults with hypertension.

Methods: We followed PRISMA 2020 guidance and searched through eight databases up to December 2025 (Cochrane Library, EBSCO, Epistemonikos, Google Scholar, ProQuest, PubMed, Scopus, and Wiley). Risk of bias was assessed with RoB 2.0. Quantitative synthesis used the R version 4.4.1.

Results: We included 27 randomized controlled trials with 1,694 participants, most rated low risk of bias. Device guided breathing reduced breathing frequency (MD -1.55 breaths/min; 95% CI -2.35 to -0.75) and lowered office diastolic blood pressure (MD -3.08 mmHg; 95% CI -5.49 to -0.67). Effects were not significant for office systolic blood pressure (MD -2.12 mmHg; 95% CI -5.01 to 0.77), ambulatory systolic blood pressure (MD -0.86 mmHg; 95% CI -3.42 to 1.70), ambulatory diastolic blood pressure (MD -0.64 mmHg; 95% CI -2.89 to 1.61), or heart rate (MD -0.71 bpm; 95% CI -2.48 to 1.06). Heterogeneity was moderate to substantial across blood pressure outcomes, and sensitivity analyses did not materially change direction or magnitude of effects overall.

Conclusion: Device guided breathing appears to modestly improve office diastolic blood pressure and reliably slows respiratory rate, supporting its use as an adjunct option in hypertension care.

Keywords: Device-guided breathing; Paced slow breathing; Hypertension; Blood pressure; Systematic review and meta-analysis.

Poster

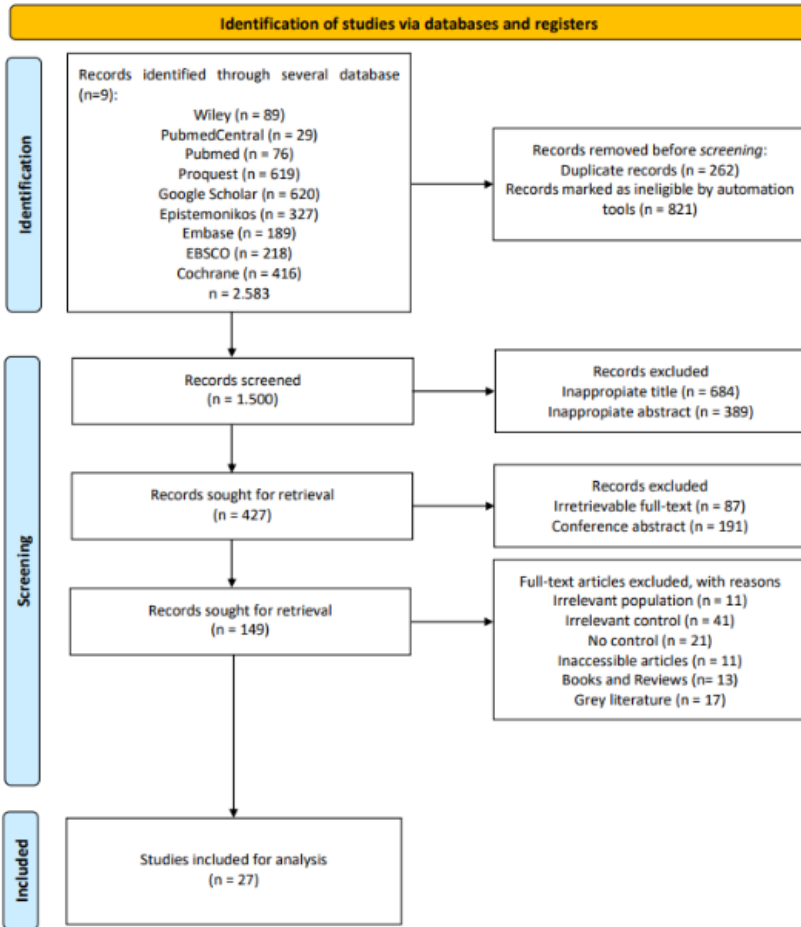


Figure 1. Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) Flowchart

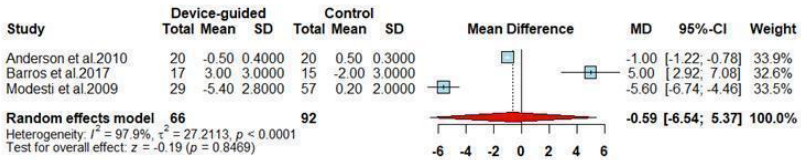


Figure 2. Forest plot of 24-hour systolic blood pressure in patients with hypertension receiving device-guided breathing exercise vs sham device

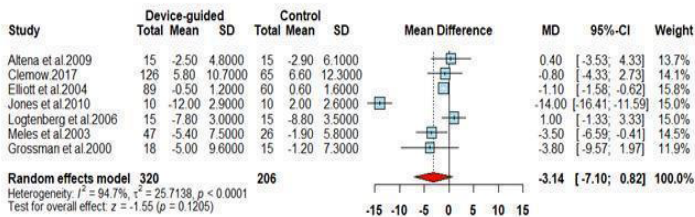


Figure 3. Forest plot of home systolic blood pressure in patients with hypertension receiving device-guided breathing exercise vs sham device

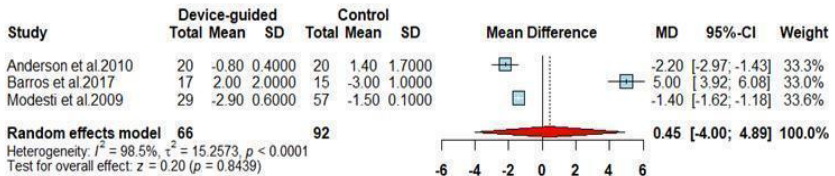


Figure 4. Forest plot of office systolic blood pressure in patients with hypertension receiving device-guided breathing exercise vs sham device

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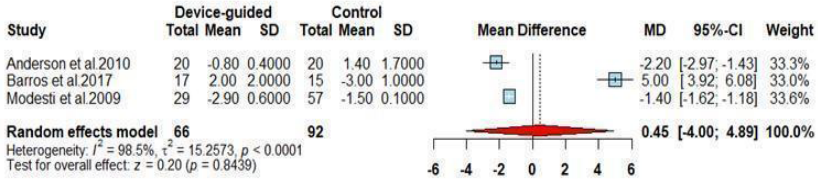


Figure 5. Forest plot of 24-hour diastolic blood pressure in patients with hypertension receiving device-guided breathing exercise vs sham device

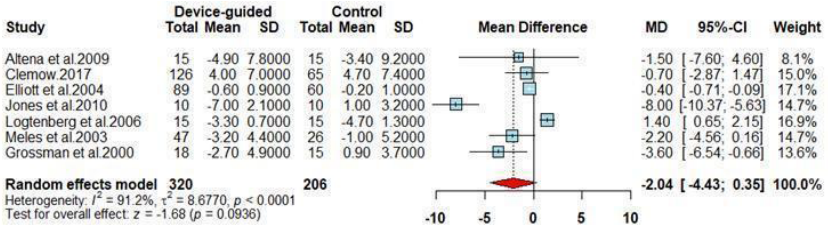


Figure 6. Forest plot of home diastolic blood pressure in patients with hypertension receiving device-guided breathing exercises vs sham device

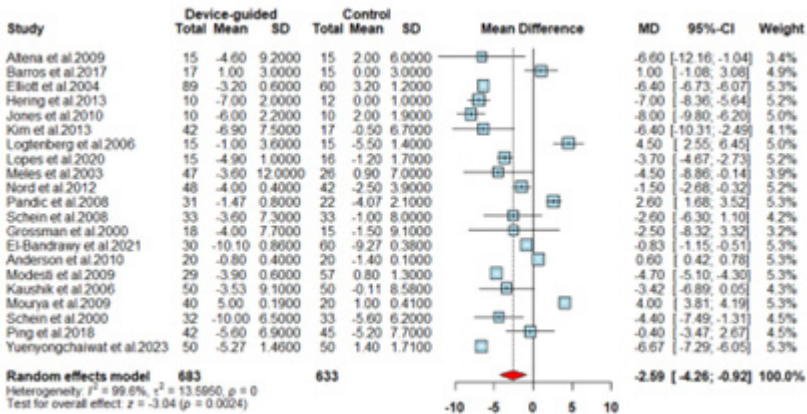


Figure 7. Forest plot of office diastolic blood pressure in patients with hypertension receiving device-guided breathing exercise vs sham device

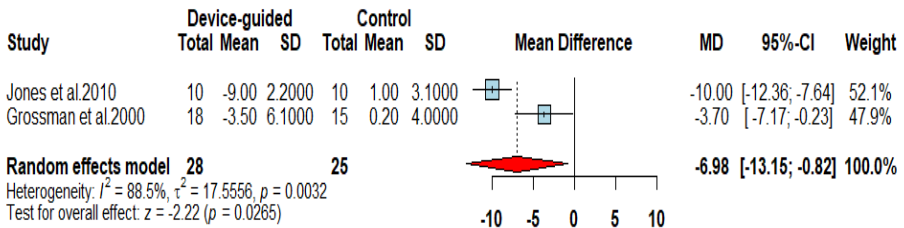


Figure 8. Forest plot of home MAP in patients with hypertension receiving device-guided breathing exercise vs sham device

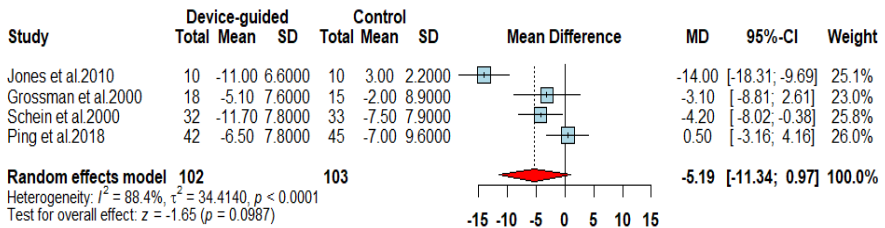


Figure 9. Forest plot of office MAP in patients with hypertension receiving device-guided breathing exercise v sham device

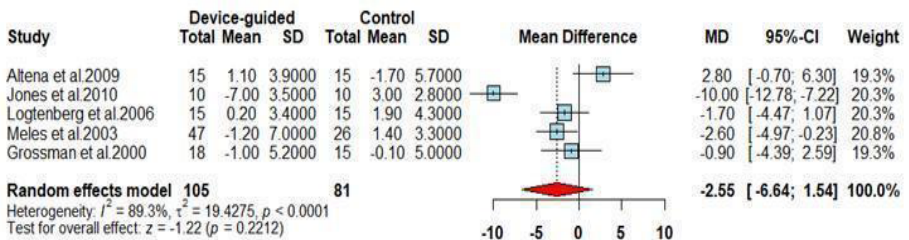


Figure 10. Forest plot of home heart rate in patients with hypertension receiving device-guided breathing exercise vs sham device

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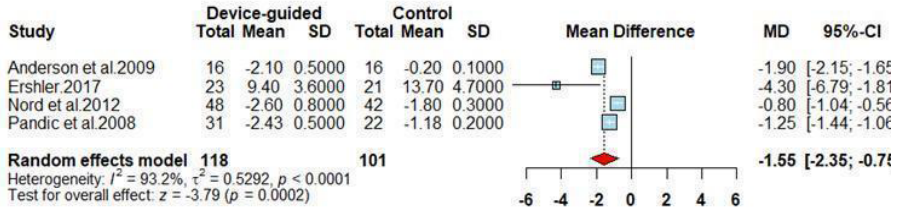


Figure 11. Forest plot of office heart rate in patients with hypertension receiving device-guided breathing exercise vs sham device

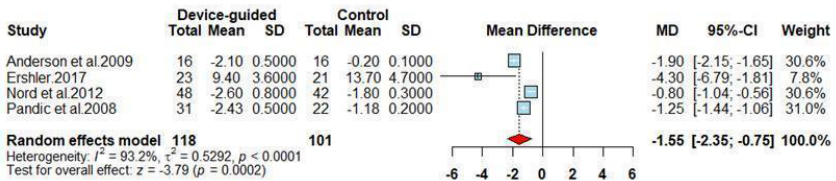


Figure 12. Forest plot of breathing frequency in patients with hypertension receiving device-guided breathing exercise vs sham device.

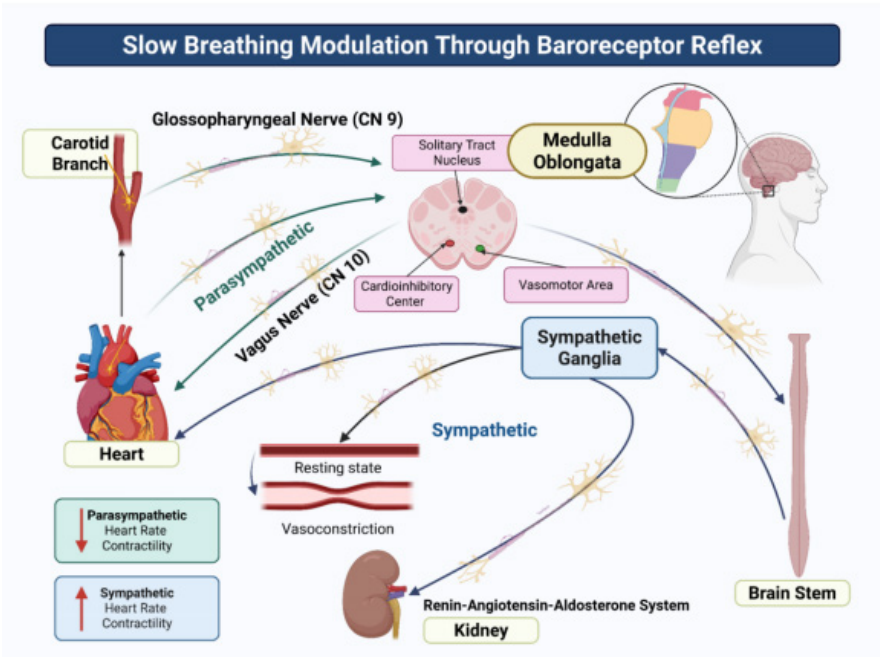


Figure 13. Baroreceptor Reflex Mechanism of Device-Guided Breathing in Lowering Blood Pressure

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Table 1. Baseline Characteristic of Included Studies

Author (Year)	Location	N	Design	S Int	S Ctrl	MA*	SDA**	Female	Male	Intervention	Control	Follow up
Altena et al. (2009) ¹²	The Netherlands	30	RCT	15	15	59.5	11.4	15	15	Device Guided breathing exercise	Music only	9 weeks
Anderson et al. (2009) ¹³	USA	32	RCT	16	16	53.2	2.5	NR	NR	Device Guided breathing	Spontaneous breathing	NR
Anderson et al. (2010) ¹⁴	USA	40	RCT	20	20	53.2	2.8	19	21	Device Guided breathing exercise	meditative relaxation exercise	4 weeks
de Barros et al. (2017) ¹⁵	Brazil	32	RCT	17	15	50.5	10	19	13	Device Guided breathing exercise	Music only	8 weeks
Clemow et al. (2017) ¹⁹	USA	191	RCT	126	65	56.65	10.8	104	87	Device Guided breathing exercise	Relaxation breathing device exercise	4 months
Elliott et al. (2004) ¹⁶	USA	149	RCT	89	60	59.1	10.1	74	75	Device Guided breathing + BP monitor	BP monitor only	8 weeks
Ershler et al. (2017) ⁸⁰	USA	44	RCT	23	21	53.2	9.8	26	18	Device Guided breathing	breathing	NR
Hering et al. (2013) ¹⁷	Poland	22	RCT	10	12	38	3	0	22	Device guided acute No and long-term slow exercise breathing exercise	breathing	8 weeks
Howorka et al. (2013) ¹⁸	Austria	32	RCT	16	16	49.4	11.9	15	17	Device Guided Usual breathing exercise treatment	breathing	8 weeks

Author (Year)	Location	N	Design	S Int	S Ctrl	MA*	SDA**	Female	Male	Intervention	Control	Follow up
Jones et al. (2010) ¹⁹	Thailand	20	RCT	10	10	50.5	5	13	7	device-guided normal breathing exercise activities	breathing	8 weeks
Kim et al. (2013) ²⁰	South Korea	59	RCT	42	17	44	10	33	26	Device-Guided Slow No Breathing Exercise Intervention	breathing	8 weeks
Landman et al. (2013) ²¹	The Netherlands	48	RCT	24	24	64.5	8.2	18	30	Device Guided breathing exercise	Sham device (music only)	8 weeks
Logtenberg et al. (2006) ²²	The Netherlands	30	RCT	15	15	61.9	6.8	17	13	Device Guided breathing	Music only	8 weeks
Lopes et al. (2020) ²³	Brazil	31	RCT	15	16	71	8.4	24	7	Device-Guided Slow Breathing Exercise	Music only	8 weeks
Meles et al. (2003) ²⁴	Italia	73	RCT	47	26	53	10.5	31	42	device-guided breathing exercise	No Intervention	8 weeks
Nord et al. (2012) ²⁵	Sweden	90	RCT	48	42	68	10.2	68	22	device-guided slow breathing exercises	music (CD)	15 months
Pandic et al. (2008) ²⁶	Sweden	53	RCT	31	22	68.5	8.5	39	14	Resperate device	music (CD)	16 weeks
Schein et al. (2008) ²⁷	Israel	66	RCT	33	33	62.5	8.5	25	41	device-guided breathing exercise	Usual care	8 weeks
Grossman et al. (2000) ²⁸	Israel	33	RCT	18	15	51	8	10	23	BIM (Breathe with Interactive Music)	Music only	8 weeks

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Author (Year)	Location	N	Design	S Int	S Ctrl	MA*	SDA**	Female	Male	Intervention	Control	Follow up
El-Bandrawy et al. (2021) ²⁹	Egypt	90	RCT	30	60	30.5	1.6	90	0	device-guided breathing exercise	aerobic exercise, no exercise	15 weeks
Modesti et al. (2009) ³⁰	Italy	86	RCT	29	57	58.76	6.31	34	52	music-guided slow breathing exercises	Relaxation exercise	6 months
Lachowska et al. (2018) ³¹	Poland	21	RCT	11	10	52	17	5	16	Slow breathing (SLOWB)	No Slow breathing	6 months
Kaushik et al. (2006) ³²	India	100	RCT	50	50	43	11.2	42	58	Slow breathing	Mental relaxation	8 weeks
Mourya et al. (2009) ³³	India	60	RCT	40	20	60	NR	29	31	slow-breathing exercises, fast-breathing exercises	No breathing exercise	3 months
Schein et al. (2000) ³⁴	Israel	65	RCT	32	33	57.1	8.7	34	31	device-guided slow breathing exercises	Music only	6 months
Ping et al. (2018) ³⁵	Malaysia	87	RCT	42	45	61.1	9.6	41	46	deep breathing exercise guided by sound cues	music only	8 weeks
Yuenyongchaiwat et al. (2023) ³⁶	Thailand	100	RCT	50	50	61.49	5.17	89	11	device-guided slow breathing exercises	Daily routine	4 weeks

*MA: Mean Age (Combined)

**SDA: SD Age (Combined)

PD-033

The Effect of Reducing Magnesium Sulfate Duration on Blood Pressure Control and Length of Stay in Preeclampsia: A Systematic Review and Meta-Analysis

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Background: Preeclampsia remains a leading cause of maternal mortality in Indonesia. While magnesium sulfate (MgSO₄) is the gold standard for seizure prophylaxis, the conventional 24-hour regimen imposes a heavy nursing burden and prolongs immobilization. Optimizing treatment duration is critical to improve resource allocation in Indonesian healthcare settings without compromising patient safety.

Objective: To evaluate the clinical efficacy and resource utilization of a 12-hour versus 24-hour postpartum MgSO₄ maintenance regimen in women with preeclampsia.

Methods: A systematic review and meta-analysis of randomized controlled trials (RCTs) was conducted following PRISMA guidelines. Data synthesis was performed using RevMan 5.4. A random-effects model with the inverse variance method was used to calculate standardized mean differences (SMD).

Results: Analysis of 4 cohorts (n=506) showed the 12-hour regimen significantly reduced postpartum MgSO₄ duration (SMD -3.87; 95% CI -4.48 to -3.26; p<0.05), though with significant heterogeneity (I²=74%). Similarly, across 5 cohorts (n=1,650), hospitalization duration was significantly shorter in the 12-hour group (SMD -0.20; 95% CI -0.30 to -0.11; p<0.05) with uniform effect sizes. Crucially, there were no statistically significant differences in hemodynamic stability between groups (n=1,548), including peak Systolic Blood Pressure (SMD 0.03;

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95% CI -0.07 to 0.13) and peak Diastolic Blood Pressure (SMD -0.02; 95% CI -0.12 to 0.08).

Conclusion: The 12-hour MgSO₄ regimen significantly reduces treatment and hospitalization duration while maintaining hemodynamic stability comparable to the 24-hour standard. This abbreviated protocol offers a safe, resource-efficient alternative that could alleviate the healthcare burden in Indonesia.

Keyword: blood pressure; magnesium sulfate; preeclampsia.

PD-034

Left atrial strain as an early marker of hypertensive heart disease in adults with primary hypertension: a systematic review

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Universitas Padjadjaran

Background: Hypertension is a major global risk factor for hypertensive heart disease (HHD). Left atrial (LA) dysfunction reflects early diastolic burden and often precedes overt structural remodeling. Conventional echocardiographic parameters may remain normal in early disease stages, whereas speckle-tracking-derived LA strain can detect subclinical functional impairment, particularly in reservoir and conduit phases.

Objective: To systematically assess whether left atrial strain parameters are more sensitive than conventional echocardiographic indices in detecting early hypertensive heart disease in adults with primary hypertension.

Methods: This systematic review was conducted in accordance with PRISMA guidelines. PubMed, ScienceDirect, and Scopus were searched

for studies evaluating LA strain using speckle-tracking or advanced deformation imaging in adults with primary hypertension and preserved ejection fraction. Data on LA phasic strain parameters and diagnostic performance were extracted. Study quality was assessed using Joanna Briggs Institute tools, and findings were synthesized narratively.

Results: Twenty-five studies were included. LA strain was consistently reduced in hypertensive patients before structural remodeling became evident. Reservoir strain showed the earliest and most pronounced impairment, followed by conduit strain, while booster pump function was initially preserved or increased before declining with disease progression. Reduced LA strain correlated with diastolic dysfunction and poor blood pressure control and demonstrated greater sensitivity than conventional volumetric indices in identifying subclinical HHD and predicting progression to HFpEF.

Conclusion: Left atrial strain is a sensitive marker of early hypertensive heart disease, detecting functional abnormalities prior to structural changes. Incorporation of LA strain assessment into routine echocardiography may improve early risk stratification and support timely preventive strategies.

PD-035

Effectiveness of Community Health Worker–Facilitated Telehealth Interventions for Hypertension : A Systematic Review and Meta-Analysis

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Valerio Jeremie Tanujaya³, James Dendy⁴, Stephen Dario Syofyan⁵

Introduction: Hypertension remains a leading cause of preventable cardiovascular morbidity and mortality worldwide, with suboptimal control rates, particularly in underserved settings. Community health worker (CHW)–facilitated telehealth has emerged as a

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potential integrated care model, but its effectiveness has not been comprehensively synthesized.

Objective: This study aimed to evaluate the effectiveness of CHW-facilitated telehealth interventions on blood pressure outcomes in adults with hypertension.

Methods: A systematic review and meta-analysis of randomized controlled trials was conducted following PRISMA guidelines. PubMed, Scopus, and ProQuest were searched from inception to December 24, 2025. Eligible studies included adults with hypertension receiving CHW-facilitated telehealth interventions compared with usual care or non-telehealth management. Primary outcomes were changes in systolic blood pressure (SBP), diastolic blood pressure (DBP), and hypertension control. Random-effects meta-analyses were performed.

Results and Discussions: Six randomized controlled trials were included. CHW-facilitated telehealth significantly reduced SBP compared with usual care (mean difference [MD] -6.44 mmHg; 95% CI -9.03 to -3.84), although heterogeneity was substantial ($I^2 = 98\%$). Hypertension control was significantly improved (risk ratio [RR] 1.68 ; 95% CI 1.31 – 2.16), with a stronger effect observed in rural settings (RR 2.11 ; 95% CI 1.81 – 2.45). DBP reduction favored the intervention but was not statistically significant (MD -2.13 mmHg; 95% CI -4.58 to 0.31).

Conclusion: CHW-facilitated telehealth interventions significantly improve systolic blood pressure and hypertension control. This integrated model represents a scalable strategy for hypertension management, particularly in underserved and rural populations.

Keywords: *community health workers; hypertension; telehealth; blood pressure control.*

PD-036

Higher Blood Pressure Variability Predicts Dementia and Cognitive Impairment: Updated Systematic Review and Meta-analysis

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Abstract

Background: Blood pressure variability (BPV) has emerged as a vascular risk marker beyond mean blood pressure (BP). Although sustained hypertension is a well-established driver of cerebral small-vessel disease and dementia, BPV may capture additional hemodynamic stress not reflected by average BP.

Objective: To synthesize longitudinal evidence on the association between BPV and incident dementia and cognitive impairment outcomes.

Method: We searched PubMed, ProQuest, and Cochrane through January 1, 2026 and included longitudinal cohorts and trials reporting HRs or ORs for incident dementia and/or cognitive impairment in relation to BPV from repeated measurements (visit-to-visit, ABPM, or beat-to-beat). Two reviewers independently extracted data and assessed quality (Newcastle–Ottawa Scale ;RoB 2.0). Random-effects pooled HRs/ORs with 95% CIs were calculated in RevMan 5.4.

Result: From 2,222 records, 21 studies were included, comprising 530,871 participants. Compared with the lowest BPV category, the highest BPV category was associated with a higher risk of adverse

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cognitive outcomes, including dementia (HR 1.65, 95% CI 1.33–2.05; $p < 0.001$) and cognitive impairment (OR 1.36, 95% CI 1.19–1.55; $p < 0.001$). The association did not differ significantly between general-population and comorbidity subgroups. In per-SD analyses, each 1-SD increase in systolic BPV was associated with a 12% higher hazard of incident dementia (HR 1.12, 95% CI 1.06–1.18; $p < 0.001$) and higher odds of cognitive impairment (OR 1.44, 95% CI 1.22–1.70; $p < 0.001$), while each 1-SD increase in diastolic BPV was associated with a 13% higher hazard of incident dementia (HR 1.13, 95% CI 1.07–1.20; $p < 0.001$).

Conclusion: Higher systolic and diastolic BPV are associated with increased risk of incident dementia and cognitive impairment. This updated meta-analysis leverages a larger dataset to provide more robust and precise estimates than prior reviews.

PD-037

Antihypertensive Chronotherapy and Its Impact on Night-Time Systolic and Diastolic Blood Pressure: A Systematic Review & Meta-Analysis

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Background : Hypertension remains a major global health burden due to rising prevalence and inadequate control, contributing significantly to cardiovascular risk. Circadian blood pressure variations, particularly non-dipping patterns, highlight the relevance of time-based treatment strategies. Chronotherapy, involving evening dosing of antihypertensive agents, aims to optimize blood pressure regulation in accordance with circadian rhythms. Night-time blood pressure is considered to provide relevant prognostic information for cardiovascular outcomes.

Objective: Due to inconsistent clinical trials outcomes, this meta-analysis

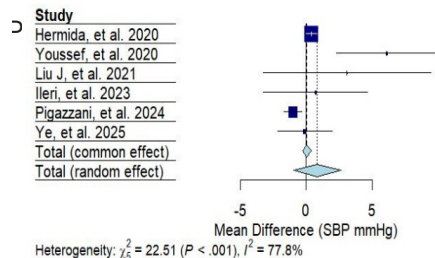
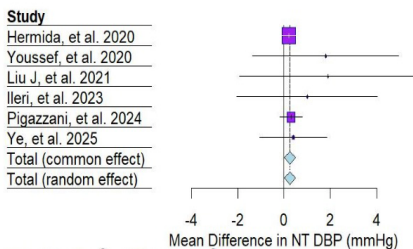
assesses the effects of evening administration of antihypertensive chronotherapy on night-time systolic and diastolic blood pressure.

Methods: A systematic search of PubMed, ScienceDirect, and Scopus identified randomized controlled trials on antihypertensive chronotherapy. Night-time systolic and diastolic blood pressure were assessed. Data extraction and quality appraisal were independently conducted by three reviewers. A random-effects meta-analysis was performed, with heterogeneity evaluated. Study quality was assessed using the Cochrane Risk of Bias 2.0 tool.

Results: Six studies were included. evening administration of antihypertensive chronotherapy showed no significant effect on night-time diastolic blood pressure with no heterogeneity ($I^2 = 0\%$). Effects on night-time systolic blood pressure were inconsistent, showing substantial heterogeneity ($I^2 = 77.8\%$), and pooled estimates were not statistically conclusive.

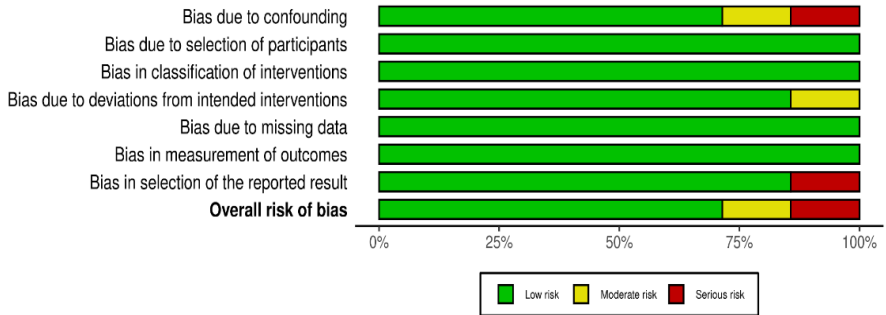
Conclusion : Evening administration of antihypertensive chronotherapy does not significantly reduce night-time diastolic blood pressure. Its effects on night-time systolic blood pressure remain inconsistent, likely reflecting substantial clinical and methodological heterogeneity across studies. Further well-designed randomized controlled trials are warranted.

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B.



C.

		Risk of bias domains							
		D1	D2	D3	D4	D5	D6	D7	Overall
Study	Hermida, 2020	+	+	+	+	+	+	+	+
	Youssef, 2020	×	+	+	+	+	+	×	×
	Jing, 2021	+	+	+	+	+	+	+	+
	Ileri, 2023	-	+	+	-	+	+	+	-
	Pigazzani, 2024	+	+	+	+	+	+	+	+
	Yan, 2024	+	+	+	+	+	+	+	+
	Ye, 2025	+	+	+	+	+	+	+	+

Domains:
 D1: Bias due to confounding.
 D2: Bias due to selection of participants.
 D3: Bias in classification of interventions.
 D4: Bias due to deviations from intended interventions.
 D5: Bias due to missing data.
 D6: Bias in measurement of outcomes.
 D7: Bias in selection of the reported result.

Judgement
× Serious
- Moderate
+ Low

Table 1 Characteristic of Included Study

No.	Author (Year)	Study Design	Sample Size	Country	Drugs of choice	Administration times of drugs	Blood Pressure	
							Night-time SBP	Night-time DBP
1	Hermida, 2020	RCT	19,084	Caucasian Spanish	≥1 antihypertensive	Evening (NR)	123.7 ± 14.6	70.3 ± 10.0
2	Jing, 2021	RCT	72	China	≥1 antihypertensive	Evening (10 p.m.)	122.6 ± 15.2	78.4 ± 8.5
3	Pigazzani, 2024	Cohort - study	5358	UK	NR	Evening (20:00-00:00)	134 (12.4)	79.1 (8.75)
4	Ye, 2025	RCT	720	China	≥1 antihypertensive	Evening (NR)	138.3(13.0)	85.8(9.4)
5	Youssef, 2020	Cross-sectional, non-randomized study	199	Egypt	NR	NR	Group 1 (once daily) : 117.0±12.4	Group 1 (once daily) : 68.4±10.0
							Group 2 (twice daily) : 123.1±13.9	Group 2 (twice daily) : 70.2±10.9
6	Ileri, 2023	RCT	116	Turkey	≥1 antihypertensive	Evening (NR)	Group ACEI based triple antihypertensive pills in evening : 116.7 ± 18.0	Group ACEI based triple antihypertensive pills in evening : 7.7 ± 12.3
							Group ARB based triple antihypertensive pills in evening : 117.0 ± 14.8	Group ARB based triple antihypertensive pills in evening : 69.2 ± 1.9

Stem Cell-Derived Secretome as a Novel Approach for Multi-Mechanism Resistant Hypertension in End-Stage Renal Failure: A Literature Review

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Background: Resistant hypertension in end-stage renal failure (ESRF) remains a critical challenge due to multifactorial mechanisms including sodium retention, overactivation of RAAS system, vascular calcification, chronic vascular inflammation from the toxins, and renal anemia that augments sympathetic activity. Conventional therapies often fail to achieve adequate blood pressure control, thus innovative strategies are needed.

Objective: This review evaluates the potential role of stem cell-derived secretome as a novel therapeutic approach to address multi-mechanism resistant hypertension in ESRF.

Methods: A literature review was conducted focusing on experimental studies investigating stem cell-derived secretome in renal injury models.

Results: Gorji et al. (2025) demonstrated significant histopathological improvement in mice with acute kidney injury (AKI) treated with kidney-derived stem cell secretome compared to controls. Similarly, Arifin et al. (2024) reported reduced pro-inflammatory cytokine levels, decreased cellular necrosis, and improved renal histology in AKI mice receiving mesenchymal stem cell (MSC) secretome. Although current evidence is limited to preclinical AKI models, these findings suggest that secretome therapy may exert paracrine-mediated effect capable of modulating inflammation, improving renal function, and potentially addressing the multifactorial pathways underlying resistant hypertension in ESRF.

Conclusion: Stem cell-derived secretome represents a promising intermittent intervention with multi-targeted effects. Further clinical

studies in ESRF populations are warranted to evaluate its efficacy in blood pressure control, glomerular filtration rate (GFR) improvement, blood urea nitrogen (BUN) reduction, and enhancement of survival and quality of life.

PD-039

Comparison of Small Interfering RNAs (siRNAs) and Antisense Oligonucleotides (ASOs) as Novel RNA-targeted Therapeutics in Hypertension: A Systematic Review and Network Meta-Analysis

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Background: Hypertension remains a leading global cause of cardiovascular morbidity and mortality. Novel RNA-targeted therapeutics, including small-interfering RNAs (siRNAs) and antisense-oligonucleotides (ASOs) have emerged as promising approaches for resistant hypertension by targeting angiotensinogen synthesis.

Objective: Evaluate the efficacy and safety of RNA-targeted therapeutics for hypertension.

Method: Systematic search was conducted with PRISMA guidelines. Studies published up to December 2025 involving adult patients with hypertension and evaluating RNA-targeted therapeutics, including siRNAs (Zilebesiran) and ASOs (IONIS AGT-LRx). The primary outcomes were the mean changes in ambulatory SBP and DBP. Safety outcomes included the incidence of serious adverse events (SAEs). Data were analyzed using RevMan5.3 and RStudio.

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Result: Five RCT with 512 participants met criteria. Zilebesiran significantly reduces mean change in ambulatory SBP at 24-weeks compared with placebo. Overall, Zilebesiran reduced SBP by -13.36mmHg (95%CI= -15.78 to -6.80) and DBP by -8.08mmHg (95%CI= -9.36 to -5.98). While IONIS AGT-LRx reduced SBP by -5.00mmHg (95%CI= -15.36 to 5.36) and DBP by -3.60mmHg (95%CI= -11.57 to 4.37). For DBP, all Zilebesiran doses demonstrated significant reductions, whereas IONIS 80 mg add-on and monotherapy were not significantly different from placebo. Zilebesiran 300mg was the most effective for DBP reduction by -9.20mmHg (95%CI= -11.85 to -6.55). The risk of SAEs between Zilebesiran and placebo with OR 0.66 (95%CI= 0.37 to 1.18), whereas IONIS AGT-LRx 80mg add-on therapy was the safest compared with placebo with RR 0.89 (95%CI=0.03 to 23.88).

Conclusion: Zilebesiran demonstrated significant reductions in SBP and DBP with favorable safety profile. Zilebesiran showed consistent dose-dependent efficacy, whereas IONIS AGT-LRx therapy did not achieve sufficient BP reduction compared with placebo, despite exhibiting an acceptable safety profile.

Keyword: *Hypertension; Small-interfering RNA; Antisense-oligonucleotides; Zilebesiran; IONIS AGT-LRx*

PD-040

Visit-to-visit Blood Pressure Variability as an Independent Factor in Cognitive Decline in Asian Population: A Systematic Review

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Putri Chantica¹, Ardelina Claudia Hartanto¹

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Background: Visit-to-visit blood pressure variability (BPV) reflects long-term instability in blood pressure control and has been shown to predict adverse cognitive outcomes independently of average blood pressure, likely through mechanisms involving cerebrovascular damage and impaired cerebral autoregulation. However, it is not yet comprehensively synthesized in Asian populations.

Objective: To evaluate existing evidence on the association of visit-to-visit blood pressure variability and cognitive decline among Asian populations.

Method: Following PRISMA guidelines, a systematic search of PubMed, Lancet, ProQuest, and Wiley was conducted on January 6, 2025 to identify observational studies on visit-to-visit blood pressure variability and cognitive decline in Asian populations. Studies were screened using predefined criteria, and risk of bias was independently assessed using the Newcastle–Ottawa Scale.

Result: Five cohort studies from Asian populations, including China, Singapore, Japan, and South Korea, were included. Higher visit-to-visit systolic blood pressure variability was consistently associated with poorer cognitive performance and accelerated cognitive decline, independent of mean blood pressure, while associations with diastolic variability were weaker and inconsistent. One large population-based cohort demonstrated a dose–response relationship, showing a 16%

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increased dementia risk in the highest systolic BP variability quartile and an approximately 18% higher risk with combined systolic–diastolic variability.

Conclusion: Visit-to-visit systolic blood pressure variability appears to be an independent risk factor for cognitive decline and dementia in Asian populations. However, the methodological consistency of the evidence is limited by the absence of standardized BPV definitions and substantial heterogeneity in BPV indices and categorization methods. Future studies should adopt standardized metrics to improve comparability and clarify BPV's clinical relevance.

Keyword: Blood pressure variability; Visit-to-visit blood pressure variability; Cognitive decline; Dementia; Asia

PD-041

Perioperative Natriuretic Peptides and the Risk of Acute Kidney Injury After Cardiac Surgery: A Systematic Review and Meta-Analysis

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ABSTRACT

Background: Acute Kidney Injury (AKI) remains a frequent and serious complication after cardiac surgery. Early identification of patients is crucial. Natriuretic peptide, including B-type natriuretic peptide (BNP) and N-terminal pro-B-type natriuretic peptide (NT-proBNP), reflect myocardial stress and may serve as prognostics biomarkers for postoperative AKI.

Objective: To evaluate the prognostic value of perioperative natriuretic peptide levels for predicting AKI after cardiac surgery.

Method: A systematic review was conducted in PubMed, Scopus, ScienceDirect, and EBSCOhost following PRISMA guidelines. Search terms included combinations of “Cardiac Surgery,” “Natriuretic Peptide,” and “Acute Kidney Injury”. Eligible studies included adult or pediatric patients undergoing cardiac surgery that evaluated perioperative natriuretic peptides and AKI. Studies reporting odds ratios (ORs) and risk ratios (RRs) were included. Study quality was assessed using the Newcastle–Ottawa Scale and meta-analyses were performed using a random-effects model. Outcomes were analyzed according to timing (preoperative vs postoperative) and biomarker type.

Result: Fourteen studies involving more than 46,000 patients were included. The strongest association was observed for postoperative NT-proBNP, which was significantly associated with an increased risk of AKI (OR 1.61; 95% CI 1.14–2.26; $I^2 = 82\%$). Elevated preoperative NT-proBNP was also significantly associated with AKI (OR 1.38; 95% CI 1.18–1.60; $I^2 = 72\%$). In contrast, preoperative BNP showed a non-significant trend toward increased AKI risk (RR 1.28; 95% CI 0.99–1.65; $I^2 = 76\%$).

Conclusion: Postoperative NT-proBNP is a strong predictor of AKI after cardiac surgery, suggesting its potential role in early postoperative risk stratification. Further studies are needed to optimize its clinical application.

Keywords: *Cardiac surgery; natriuretic peptide; acute kidney injury; prognostic.*

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PD-042

A New Hope for Resistant Hypertension: Efficacy and Safety of Baxdrostat and Lorundrostat from a Meta-Analysis of Clinical Trials

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Background: Baxdrostat and Lorundrostat are novel aldosterone synthase inhibitors. Although both agents have demonstrated blood pressure-lowering effects, their efficacy and safety profiles in placebo-controlled studies have not yet been comprehensively synthesized.

Objective: Evaluate the efficacy and safety of baxdrostat and lorundrostat in patients with resistant hypertension.

Methods: A systematic review and meta-analysis were conducted in accordance with PRISMA guidelines. Six randomized controlled trials (RCTs) were included. The primary efficacy outcome was change in systolic blood pressure (SBP), expressed as mean difference (MD). Safety outcomes included adverse events (AE), reported as odds ratios (ORs).

Results: Single-arm analyses showed reductions in SBP across all doses. In placebo-controlled analyses, baxdrostat was associated with significant SBP reductions at both 1 mg (MD -4.2 mmHg; 95%CI: -4.5 to -3.9) and 2 mg (MD -5.0 mmHg; 95%CI: -5.3 to -4.8). Lorundrostat also demonstrated significant reductions versus placebo at 50 mg (MD -3.2 mmHg; 95%CI: -4.4 to -1.9) and 100 mg (MD -2.2 mmHg; 95%CI: -2.8 to -1.7). Neither baxdrostat nor lorundrostat showed a higher risk of serious adverse events across doses (p -value ≥ 0.05). Baxdrostat showed a higher risk of hyperkalemia at the 2 mg dose (OR 7.12; p -value <0.05), while no higher risk of other adverse events was observed. In contrast, lorundrostat showed higher risks of common adverse events, hyperkalemia, and hyponatremia at both doses.

Conclusions: Aldosterone synthase inhibitors are associated with significant reductions in SBP compared with placebo. Both agents demonstrated acceptable safety profiles, with electrolyte disturbances representing the primary safety consideration.

Keywords: Aldosterone synthase inhibitors; Baxdrostat; Lorundrostat; Resistant Hypertension; Meta-analysis.

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SGLT2 Inhibitors in Chronic Kidney Disease: Renal and Cardiovascular Outcomes—A Systematic Review Following PRISMA

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Background: Chronic kidney disease (CKD) is a major driver of morbidity, mortality, and health-system costs due to progression to kidney failure and heightened cardiovascular risk. Sodium-glucose cotransporter-2 (SGLT2) inhibitors have evolved from glucose-lowering agents to therapies with kidney- and cardiovascular-protective effects that appear partly independent of glycemic control.

Objective: To synthesize evidence on the efficacy and safety of SGLT2 inhibitors in adults with CKD, focusing on kidney disease progression and cardiovascular outcomes.

Methods: Following PRISMA principles, we reviewed the provided full-text document set. Eligible studies were randomized controlled trials enrolling adults with CKD, with or without diabetes, comparing an SGLT2 inhibitor with placebo/standard care and reporting prespecified kidney outcomes. Selection and extraction followed a PICO framework; due to heterogeneity in CKD criteria and endpoint definitions, synthesis

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was narrative. PRISMA flow: 8 records identified and screened; 8 full texts assessed; 4 studies included and 4 excluded (reviews/practice guidance).

Results: Across landmark RCTs, SGLT2 inhibitors reduced composite kidney outcomes: CREDENCE HR 0.70 (95% CI 0.59–0.82), DAPA-CKD HR 0.61, and EMPA-KIDNEY HR 0.72 (95% CI 0.64–0.82). EMPA-KIDNEY long-term follow-up showed sustained benefit for kidney progression or cardiovascular death (HR 0.79; 95% CI 0.72–0.87). Benefits were consistent in both diabetic and non-diabetic CKD subgroups. Safety was acceptable, with attention to initial eGFR dip, volume depletion, genital infections, and rare diabetic ketoacidosis.

Conclusion: Across major kidney outcome RCTs, SGLT2 inhibitors consistently slow CKD progression and confer cardiovascular benefits in CKD populations, including in selected patients without diabetes. Early renal function monitoring and proactive adverse-event mitigation are important for safe implementation.

Keywords: SGLT2 inhibitors; chronic kidney disease; renal outcomes; cardiovascular outcomes; PRISMA; randomized controlled trials.

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Long-Term Cardiovascular Outcomes of Early-Onset Hypertension in Young Adults: A Systematic Review

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Background: Hypertension is increasingly prevalent in individuals under 45 yet remains underdiagnosed due to low perceived short-term risk. Unlike late-onset cases, early-onset hypertension (EOH) initiates a prolonged trajectory of vascular stress, accelerating arterial

aging and cumulative target organ damage. Current risk models often fail to capture this lifetime cardiovascular burden, leading to clinical *therapeutic inertia*.

Objective: To systematically evaluate the association between EOH in young adults (18 - 45 years) and long-term major adverse cardiovascular events (MACE).

Methods: Following PRISMA 2020 guidelines, we searched PubMed, Scopus, and Semantic Scholar for cohort studies with ≥ 10 -year follow-up. EOH was defined as BP 130/80 mmHg or a clinical diagnosis before age 45. Two reviewers independently assessed risk of bias using the Newcastle-Ottawa Scale.

Results: From 2,450 identified records, 17 studies met the inclusion criteria. EOH was associated with a significantly elevated risk of MACE compared to normotensive peers (pooled HR: 2.10–2.30). Even "high-normal" blood pressure (130–139/80–89 mmHg) was associated with a 1.35-fold risk (95% CI: 1.22–1.49). Long-term data demonstrated that EOH predicted mid-life coronary artery calcification (OR: 2.94) and left ventricular hypertrophy (OR: 2.29). Risks were most pronounced for stroke in East Asian cohorts and coronary heart disease in Western populations.

Conclusion: EOH is a potent independent predictor of premature cardiovascular morbidity and mortality. The cumulative "blood pressure-years" burden suggests that the window for preventing irreversible organ damage begins in early adulthood. Clinical guidelines should prioritize lifetime risk over 10-year risk to improve early intervention strategies.

Keywords: Early-onset hypertension; Young adults; Cardiovascular outcomes; Stroke; Coronary heart disease.

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PD-045

Safety of Nifedipine and Labetalol in Pregnant Women with Mild Hypertension: A Systematic Review and Meta-Analysis

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Background: Hypertension in pregnancy is defined as blood pressure $\geq 140/90$ mmHg. It may lead to maternal and fetal complications. Nifedipine and labetalol are recommended first-line antihypertensive agents. However, evidence regarding their safety in mild hypertension remains limited.

Objective: To compare the safety of nifedipine and labetalol in mild hypertension during pregnancy, including maternal and fetal outcomes.

Method: A systematic search was conducted in PubMed, Scopus, and Cochrane databases. Studies were screened using predefined eligibility criteria by Rayyan. RCTs and cohort studies were analysed separately using RevMan 5.4. Risk of bias was assessed using RoB 2 and NOS.

Results: Three RCTs and three retrospective cohort studies were included. Maternal outcomes were comparable for preeclampsia (RR 1.23 [0.86–1.75], $p = 0.25$, $I^2 = 25\%$), placental abruption (RR 0.86 [0.36–2.06], $p = 0.53$, $I^2 = 0\%$), and C-section (RR 0.94 [0.71–1.25], $p = 0.46$, $I^2 = 0\%$). Fetal or neonatal outcomes were comparable for preterm birth (RR 1.16 [0.75–1.78], $p = 0.15$, $I^2 = 53\%$), small for gestational age (RR 0.89 [0.66–1.20], $p = 0.51$, $I^2 = 0\%$), mortality (RR 0.96 [0.56–1.83], $p = 0.59$, $I^2 = 0\%$), NICU admission (RR 1.14 [0.97–1.34], $p = 0.76$, $I^2 = 0\%$), and respiratory support (RR 1.28 [0.96–1.71], $p = 0.30$, $I^2 = 7\%$). Cohort

studies presented comparable findings.

Conclusion: Nifedipine and labetalol demonstrate comparable safety profiles in mild hypertension during pregnancy. However, further studies are required due to the limited number of included studies.

PD-046

Tuning Down the Pressure: Assessing the Efficacy of Music as an Adjuvant Therapy in Hypertensive Patients - A Systematic Review and Meta Analysis of Randomized Clinical Trials

ABSTRACT

Introduction: Hypertension affects more than 1.13 billion people worldwide and remains a major, modifiable driver of cardiovascular disease and mortality. Although drug therapy works, side effects, cost, and adherence barriers keep the door open for scalable adjunctive strategies. Music therapy, by influencing autonomic balance and cardiovascular stress pathways, has been proposed as a simple, non-invasive approach. We evaluated whether music therapy lowers blood pressure and improves related physiological and quality-of-life outcomes in people with hypertension.

Objective: To evaluate the efficacy of music therapy as a non-invasive adjunct intervention for reducing blood pressure

Methods: This systematic review and meta-analysis followed PRISMA 2020 guidance. We searched eight databases up to December 2025 (Cochrane Library, EBSCO, Epistemonikos, Google Scholar, ProQuest, PubMed, Scopus, and Wiley). Risk of bias was assessed with RoB 2.0. Quantitative synthesis used the R version 4.4.1.

Results: We included 29 randomized controlled trials comprising 1,723 participants; overall study quality was assessed as low risk of bias. Music therapy was associated with lower systolic blood pressure (MD

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-6.11 mmHg; 95% CI -8.83 to -3.38; $p < 0.0001$) and lower diastolic blood pressure (MD -3.02 mmHg; 95% CI -4.59 to -1.44; $p = 0.0002$), with substantial heterogeneity for diastolic blood pressure ($I^2 = 99.9\%$). Secondary outcomes showed non-significant trends favouring music therapy for heart rate (MD -1.43 bpm; $p = 0.3457$), mean arterial pressure (MD -2.47 mmHg; $p = 0.0641$), respiratory rate (MD -1.58 breaths/min; $p = 0.2626$), and quality of life (MD 4.05; $p = 0.6702$).

Conclusion: Across randomized trials, music therapy was associated with meaningful reductions in both systolic and diastolic blood pressure and may confer broader wellbeing benefits. Given its accessibility, safety, and low cost, music therapy is a reasonable complementary option alongside standard hypertension care; however, more rigorous trials with standardised protocols and longer follow-up are needed to clarify durability and best implementation.

Keywords: *Hypertension; music therapy; blood pressure; non-invasive adjunct; meta-analysis.*

Table 1. PICO Framework

Components of PICO	Definition
Population	Patients diagnosed with hypertension
Intervention	Music therapy as a non-invasive adjunct treatment
Comparison	Placebo, usual care, or other control interventions without music therapy
Outcome	Primary: Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP). Secondary: Heart Rate (HR), Mean Arterial Pressure (MAP), Respiratory Rate (RR), Quality of Life (QoL)

Abbreviations: PICO, Population, Intervention, Comparison, and Outcome

Table 2. Table of Study Characteristics

Author, Year	Study Location	Study Design	Sample Size	Age (Combine)		Female	Male	Intervention	Control	Type of Music	Follow-up Period
				N	Mean						
Allen et al., 2001 ¹⁶	USA	RCT	20	20	75,5	NR	30	10	Music	Non music	NR
Altena et al., 2009 ¹⁷	Netherlands	RCT	15	15	59,5	11,35	15	15	Music	Breathing device	9 weeks
Astuti et al., 2017 ¹⁸	Indonesia	RCT	50	50	67,01	5,53	62	38	Music	Muscle relaxation	NR
Bekiroglu et al., 2013 ¹⁹	Turkey	RCT	30	30	NR	NR	26	34	Music	Resting	4 weeks
Chan et al., 2009 ²⁰	China	RCT	23	24	NR	NR	26	21	Music	Control	4 weeks
										Western classical (Beethoven's Symphony No. 5), Western jazz (April in Paris, Dreamsville), Chinese classical (TAO, Lord of Wind), and Asian classical (Everlasting Road)	

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Dewi et al., 2024 ²¹	Indonesia	80	RCT	40	40	68,06	4,84	40	40	Music	Non music	Instrumental music	4 weeks
Grossman et al., 2001 ²²	Israel	33	RCT	18	15	51	8	10	23	Music	Control	Quiet synthesized music	4 weeks
Im-oun et al., 2018 ²³	Thailand	114	RCT	57	57	51,65	8,8	70	44	Music	Control	Thai instrumental folk music	4 weeks
Kunikullaya et al., 2015 ²⁴	India	88	RCT	45	43	46,69	8,5	21	67	Music	Non music	Indian classical music (instrumental)	3 months
Kunikullaya et al., 2015 ²⁵	India	93	RCT	46	47	46,69	8,5	25	68	Music	Lifestyle modification	Indian classical music (instrumental)	3 months
Landman et al., 2013 ²⁶	Netherlands	45	RCT	21	24	64,45	4,15	15	30	Music	Sham	Musical tones	8 weeks
Logtenberg et al., 2007 ²⁷	Netherlands	30	RCT	15	15	61,85	6,75	17	13	Music	Breathing device	Various kinds of random music	NR
Metgud et al., 2023 ²⁸	India	52	RCT	26	26	48,02	5,137	19	33	Music	Aerobic exercise	Instrumental music	2 weeks
Mir et al., 2020 ²⁹	Malaysia	29	RCT	15	14	21,05	1,61	NR	NR	Music	Control	Instrumental music	4 weeks
Modesti et al., 2010 ³⁰	Italy	59	RCT	26	31	59,5	NR	21	36	Music	Reading	Instrumental music	6 months
Pandic et al., 2008 ³¹	Sweden	53	RCT	22	31	68,46	9	39	14	Music	Resperate	Relaxing music	16 weeks
Ping et al., 2018 ³²	Malaysia	83	RCT	44	39	61,15	9,6	37	46	Music	Music + breathing	Background music without any identifiable rhythm	8 weeks
Schein et al., 2001 ³³	Israel	65	RCT	32	33	57,15	8,7	0	65	Music	Control	Musical sound patterns, quiet synthesized music	8 weeks

Steelman, 1990 ³⁴	USA	43	RCT	21	22	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	Tranquil music (patient-selected)	NR
Tang et al., 2009 ³⁵	USA	41	RCT	19	22	85,5	5,5	35	6	NR	NR	NR	NR	NR	NR	NR	NR	Sedative music	3 months
Zanini et al., 2009 ³⁶	Brazil	45	RCT	23	22	66,85	9,35	26	19	NR	NR	NR	NR	NR	NR	NR	NR	Active and receptive music	12 weeks
Cao et al., 2016 ³⁷	China	60	RCT	30	30	29,35	4,2	60	0	NR	NR	NR	NR	NR	NR	NR	NR	Folk music and symphonies (Beethoven, Schubert, and Tchaikovsky)	NR
Teng et al., 2007 ³⁸	China	30	RCT	15	15	83,1	8,2	22	8	NR	NR	NR	NR	NR	NR	NR	NR	Classical music	4 weeks
Mathew et al., 2021 ³⁹	India	120	RCT	60	60	49,07	7,935	63	57	NR	NR	NR	NR	NR	NR	NR	NR	Instrumental music	3 months
Borzoo et al., 2025 ⁴⁰	Iran	109	RCT	56	53	NR	NR	59	50	NR	NR	NR	NR	NR	NR	NR	NR	Classical music	NR
Lorber et al., 2022 ⁸	Denmark	60	RCT	30	30	NR	NR	33	27	NR	NR	NR	NR	NR	NR	NR	NR	Relaxing classical music (Mozart, Debussy)	NR
Mandel et al., 2007 ⁴¹	USA	68	RCT	35	33	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Purnomo et al., 2020 ⁴²	Indonesia	46	RCT	23	23	NR	NR	17	29	NR	NR	NR	NR	NR	NR	NR	NR	Instrumental music	NR
																		Standard pharmacological therapy	
																		Self-hypnosis Therapy	

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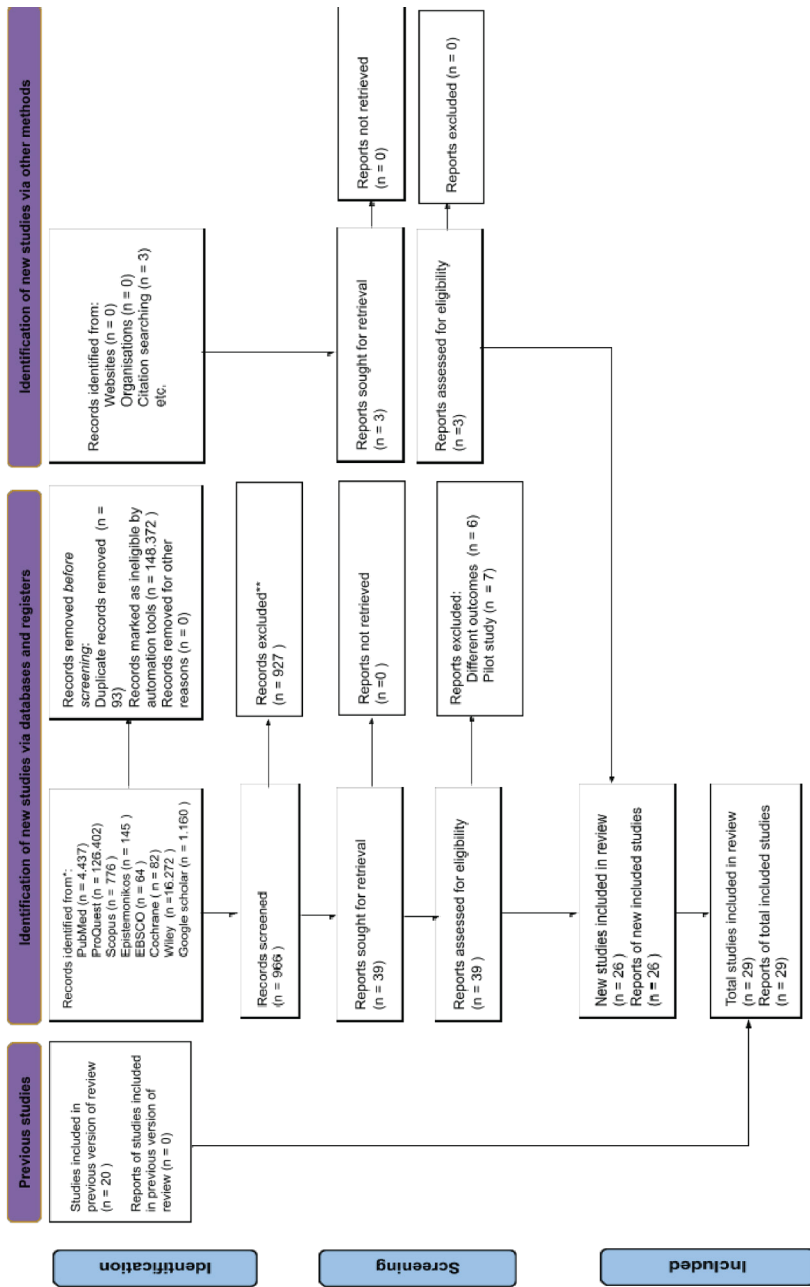


Figure 1. PRISMA Flow Chart

Study	Risk of bias domains					Overall
	D1	D2	D3	D4	D5	
Allen et al,2001	+	+	+	+	+	+
Altena et al,2009	+	+	+	+	+	+
Astuti et al,2017	+	+	+	+	+	+
Bekiroglu et al,2013	?	+	+	+	+	+
Borzoo et al,2025	+	+	-	+	+	-
Cao et al,2016	+	+	+	+	+	+
Chan et al,2009	+	+	+	+	+	+
Dewi et al,2024	+	+	+	+	+	+
Grossman et al,2001	+	?	+	+	+	+
Im-oun et al,2018	+	+	+	+	+	+
Kunikullaya et al,2015	+	+	+	+	+	+
Kunikullaya et al,2015b	+	+	+	+	+	+
Landman et al,2013	+	+	+	⊗	+	⊗
Logtenberg et al,2007	+	+	+	+	+	+
Lorber et al,2022	+	+	+	+	+	+
Mandel et al,2007	+	+	+	+	+	+
Mathew et al,2021	+	+	+	+	+	+
Metgud et al,2023	+	+	+	-	+	-
Mir et al,2020	+	+	+	+	+	+
Modesti et al,2010	+	+	+	+	+	+
Pandic et al,2008	+	+	+	+	-	-
Ping et al,2018	+	+	+	+	+	+
Purnomo et al,2020	+	+	+	+	+	+
Schein et al,2001	+	+	+	+	+	+
Steelman,1990	+	+	+	?	+	+
Tang et al,2009	+	+	+	+	+	+
Teng et al,2007	+	+	+	+	+	+
Zanini et al,2009	+	+	+	+	+	+

Domains:
D1: Bias arising from the randomization process.
D2: Bias due to deviations from intended intervention.
D3: Bias due to missing outcome data.
D4: Bias in measurement of the outcome.
D5: Bias in selection of the reported result.

Judgement
⊗ High
- Some concerns
+ Low
? No information

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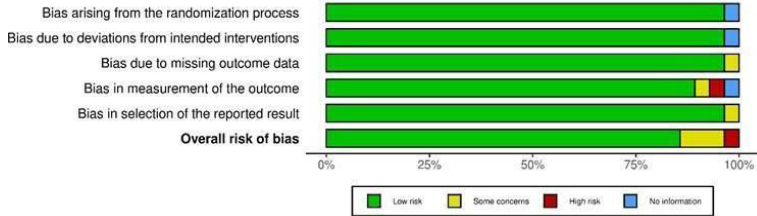


Figure 2. Risk of bias summary using the Cochrane Risk of Bias 2.0 tool for randomized-controlled trial studies. The green region represents studies with low risk of bias, the yellow region shows studies with unclear risk of bias, the red region shows studies with high risk of bias, and the blue region shows studies with a lack of information regarding risk of bias.

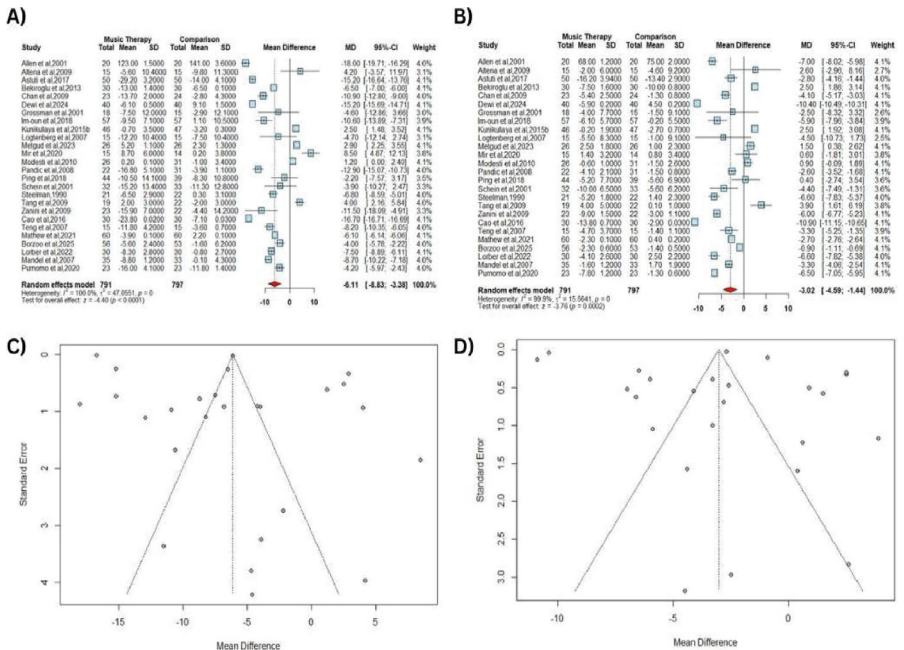


Figure 3. Forest and funnel plots evaluating the effects of music therapy compared to control groups on blood pressure outcomes in hypertensive patients. (3A) Forest plot of the mean difference in systolic blood

pressure. **(3B)** Forest plot of the mean difference in diastolic blood pressure. **(3C)** Funnel plot assessing publication bias in studies reporting systolic blood pressure. **(3D)** Funnel plot assessing publication bias in studies reporting diastolic blood pressure.

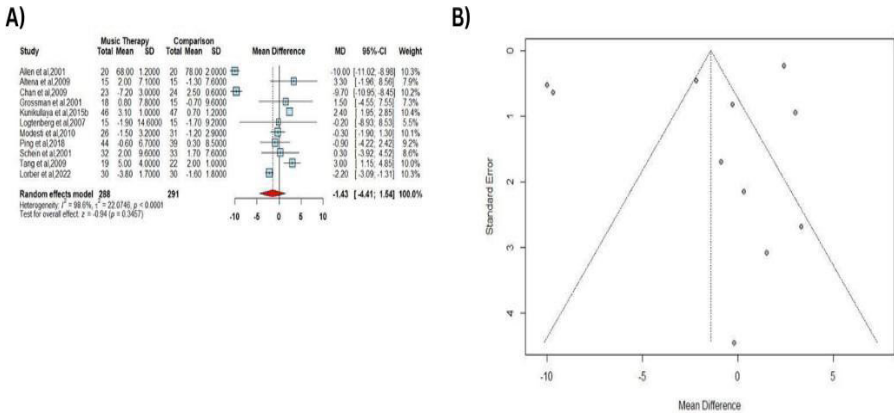


Figure 4. Forest and funnel plots evaluating the effect of music therapy compared to control groups on heart rate in patients with hypertension. **(4A)** Forest plot of the mean difference in heart rate between music therapy and control groups. **(4B)** Funnel plot assessing publication bias in studies reporting heart rate outcomes.

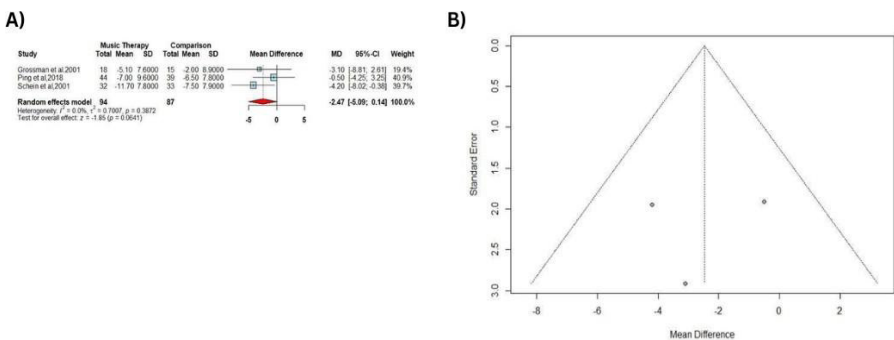


Figure 5. Forest and funnel plots evaluating the effect of music therapy compared to control groups on mean arterial pressure in patients with

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hypertension. **(5A)** Forest plot of the mean difference in mean arterial pressure between music therapy and control groups. **(5B)** Funnel plot assessing publication bias in studies reporting mean arterial pressure outcomes.

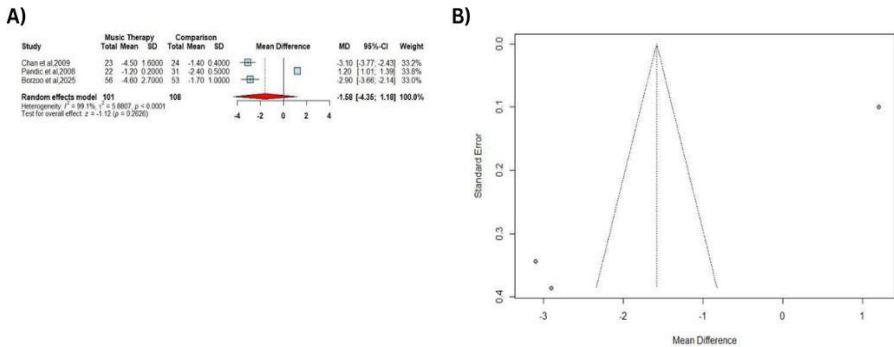


Figure 6. Forest and funnel plots evaluating the effect of music therapy compared to control groups on respiratory rate in patients with hypertension. **(6A)** Forest plot of the mean difference in respiratory rate between music therapy and control groups. **(6B)** Funnel plot assessing publication bias in studies reporting respiratory rate outcomes.

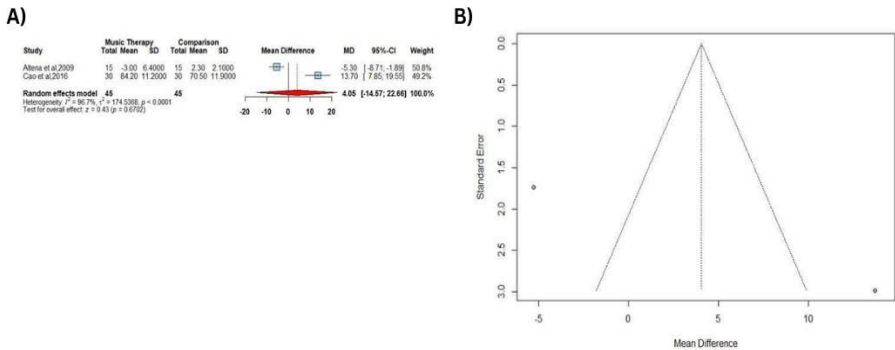


Figure 7. Forest and funnel plots evaluating the effect of music therapy compared to control groups on quality of life in patients with hypertension. **(7A)** Forest plot of the mean difference in quality of life between music therapy and control groups. **(7B)** Funnel plot assessing publication bias in studies reporting quality of life outcomes.

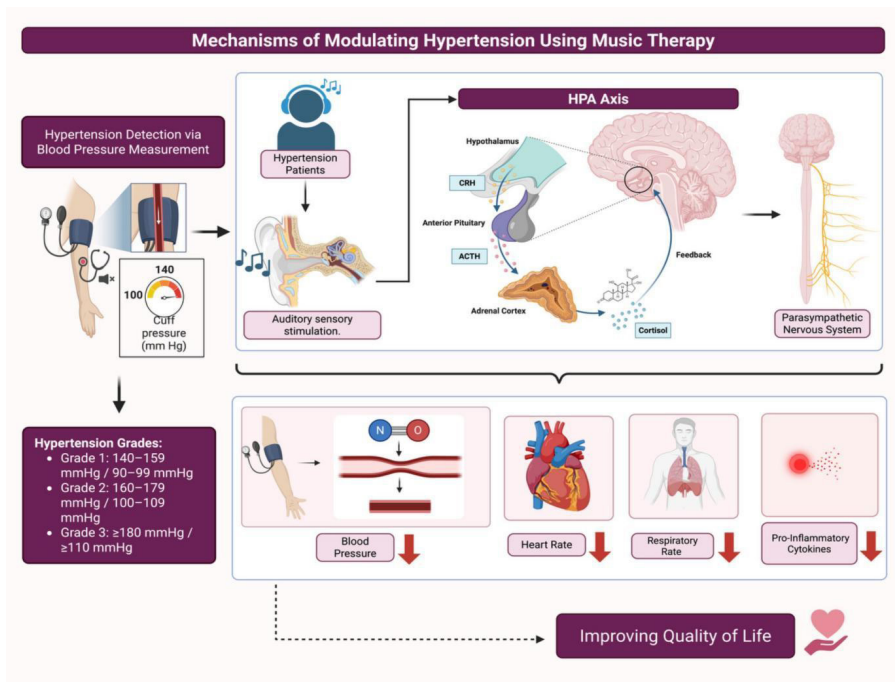


Figure 8. Mechanism of Music Therapy in Hypertensive Patient

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Efficacy of Baxdrostat and Lorundrostat in Uncontrolled and Resistant Hypertension: A Systematic Review of RCTs

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Background: Hypertension continues to be a major global health challenge and a leading cause of cardiovascular disease and death. Although many antihypertensive medications are available, a significant number of patients still fail to achieve adequate blood pressure control. In many cases, this is associated with excessive aldosterone activity. Aldosterone synthase inhibitors, such as baxdrostat and lorundrostat, have recently gained attention as add-on therapies that directly suppress aldosterone production. However, evidence from randomized clinical trials is still evolving.

Objective: To evaluate the efficacy of baxdrostat and lorundrostat as add-on therapy for systolic blood pressure reduction in adults with uncontrolled or treatment-resistant hypertension.

Methods: A systematic search of PubMed, PMC and ScienceDirect, was conducted up to January 2026. Three reviewers independently screened RCTs enrolling adults (≥ 18 years) with uncontrolled or treatment-resistant hypertension receiving aldosterone synthase inhibitors as add-on therapy to background antihypertensive treatment and reporting changes in systolic blood pressure. Studies were excluded if they had incomplete data, were non-original articles or represented duplicate publications. Risk of bias was assessed using RoB 2.

Results: Four randomized controlled trials involving 2,410 patients. Baxdrostat and lorundrostat each demonstrated significant reductions in systolic blood pressure compared with placebo when used as add-on therapy in patients with uncontrolled or treatment-resistant

hypertension. Baxdrostat showed dose-dependent reductions in seated systolic blood pressure at 12 weeks, while lorundrostat produced significant reductions across ambulatory and automated office measurements at 4 to 12 weeks. Three studies had low risk of bias and one had moderate risk.

Conclusion: Baxdrostat and lorundrostat, when added to background antihypertensive therapy, were consistently associated with short-term reductions in systolic blood pressure. Baxdrostat showed dose-related blood pressure lowering, while lorundrostat demonstrated efficacy across both ambulatory and office-based measurements.

Keywords: Baxdrostat; Lorundrostat; Hypertension

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Measurement of Serum Visfatin Level as a Predictor for Hypertension, Heart Failure, and Coronary Artery Disease: A Systematic Review and Meta-Analysis

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Background: Hypertension is increasingly recognized as a metabolic-inflammatory disorder associated with adipose tissue dysfunction, in which adipokines play a central role in vascular regulation. Visfatin may

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contribute to the pathogenesis of hypertension by stimulating the release of proinflammatory cytokines, which subsequently impair vascular function and disrupt endothelial-derived regulatory mechanisms.

Objective: To systematically evaluate the role of serum visfatin measurement to predict hypertension, heart failure, and coronary artery disease.

Methods: This study was reported based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. Systematic literature searches were performed through PubMed, Scopus, ScienceDirect, and EBSCOHost from inception to November, 2025. Studies fulfilling pre-determined inclusion and exclusion criteria were qualitatively appraised using Joanna-Briggs Institute (JBI) Critical Appraisal Tools for Randomized-controlled Trials and quantitatively analysed using Review Manager version 5.4. Pooled estimates of outcomes are presented as Risk Ratio (RR) with 95% confidence interval.

Results: The current meta-analysis comprised 29 studies with a total of 3,264 participants. Higher level of serum visfatin was associated with hypertension (mean difference: 0.24 [0.08, 0.40], p 0.003; I² 96%, P heterogeneity < 0.00001), coronary artery disease (mean difference: 3.10 [3.00, 3.19], p < 0.00001; I² 99%, P heterogeneity < 0.00001), and heart failure (mean difference: 6.15 [5.29, 7.02], p < 0.00001; I² 87%, P heterogeneity < 0.006).

Conclusion: This review indicates that visfatin may serve as a potential biomarker for hypertension, heart failure, and ischemic heart disease. However, further studies are needed to strengthen the existing evidence.

Keyword: Visfatin; Adipokine; Biomarker; Hypertension; Heart failure; Coronary artery disease

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Reaching the Unreachable Blood Pressure: Efficacy and Safety of Baxdrostat in Uncontrolled and Resistant Hypertension - A Systematic Review and Meta- Analysis

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ABSTRACT

Background and Objective: Baxdrostat is a novel therapy for resistant hypertension and was briefly mentioned in the latest ESC guideline based on early phase II data. With new phase III findings available, this meta-analysis aims to provide an updated evaluation of its efficacy and safety in patients with uncontrolled and resistant hypertension.

Method: A comprehensive literature search was conducted in accordance with PRISMA guidelines to identify randomized controlled trials comparing baxdrostat with placebo. Eligible studies included adults with uncontrolled or resistant hypertension who were receiving standard antihypertensive therapy consisting of 2-3 agents. The primary outcome was change in systolic blood pressure (SBP). Secondary outcomes included adverse events, particularly hyperkalemia, hyponatremia, and hypotension.

Results: 805 studies screened, three RCTs comprising 1,259 patients across 7 study arms were included. One included trial enrolled a CKD population with mean baseline eGFR of 44-46 mL/min/1.73m². Baxdrostat significantly reduced SBP (MD: -8.72 mmHg; 95% CI: -10.74 to -6.69; $p < 0.00001$; I² 0%). Adverse effect included risk of hyperkalemia (OR: 9.78; $p < 0.00001$), hyponatremia (OR: 2.24; $p = 0.25$), and hypotension (OR: 2.40; $p = 0.21$). The antihypertensive effect was consistent across

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varying levels of baseline renal function. No significant differences were observed between groups in terms of hypotension and hyponatremia. Meanwhile hyperkalemia remains a notable risk. Risk of bias assessment showed generally low risk across studies.

Conclusion: Baxdrostat demonstrated significant blood pressure-lowering efficacy with an acceptable safety profile in patients with uncontrolled and resistant hypertension. These findings support baxdrostat as a promising future therapeutic option for patients with difficult-to-treat hypertension.

Keywords: Baxdrostat; Resistant hypertension; Aldosterone synthase inhibitor; Randomized Control Trial; Meta-analysis

PD-050

MASKED HYPERTENSION AS AN UNDERRECOGNIZED RISK FACTOR FOR STROKE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Masked hypertension, defined as normal office BP (<140/90 mmHg) with elevated out-of-office BP measured by ambulatory or home BP monitoring (>135/85 mmHg), represents a major underrecognized phenotype of hypertension. Affected individuals frequently remain undiagnosed, resulting in delayed risk stratification. As a result, risk is often unrecognized until it is too late.

Objective: To evaluate the association between masked hypertension and stroke compared to normotension.

Methods: A literature search was conducted in PubMed, PubMed Central (PMC) and ScienceDirect databases using the following terms:

("masked hypertension" AND stroke AND (risks OR outcomes)). Eligible studies were cohort studies involving adults (≥ 18 years) with masked hypertension defined by ambulatory or home BP monitoring and reporting stroke outcomes. Hazard ratios (HRs) and incidence-based risk ratios (RRs) were pooled using random-effects models. Sensitivity-analyses were done to further evaluate the findings. Risk of bias was assessed using the Newcastle–Ottawa Scale (NOS).

Results: In the primary HR analysis ($n = 7,775$), masked hypertension was associated with a significantly increased risk of stroke compared with normotension (HR 2.09, 95% CI [1.42–3.06]). Incidence-based RR analyses ($n = 6,052$) demonstrated a higher stroke risk for patients with masked hypertension (RR 3.51, 95% CI [1.64–7.53]). In sensitivity-analyses, the associations remained significant (HR 3.45, 95% CI [1.37–8.73]; RR 2.72, 95% CI [2.03–3.66])

Conclusion: Masked hypertension is associated with a significantly high risk of stroke compared to normotension. These findings highlight a clinical blind spot for stroke prevention.

Keywords: Masked hypertension; stroke; stroke risk; normotension; ambulatory blood pressure monitoring (ABPM); home blood pressure monitoring (HBPM).

Efficacy and Safety of Aprocitentan in Resistant Hypertension: A Systematic Review of RCTs

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Background: Resistant hypertension (RHTN) persists despite optimal multidrug therapy and carries high cardiovascular risk. Aprocitentan, a dual endothelin receptor antagonist, is proposed as adjunctive therapy for patients with RHTN; its efficacy and safety compared with placebo or standard therapy therefore remain uncertain.

Objective: To assess the efficacy and safety of Aprocitentan compared with placebo or standard therapy in adults with RHTN.

Method: Studies were sourced in November 2024 via PubMed, PMC, Europe PMC, Cochrane following PRISMA. Randomized controlled trials (RCTs) in phases II-III that included patients with RHTN considered eligible. Excluding observational studies, case reports, non-English publications and studies not providing full-text accessibility. After screening 274 records, 3 studies were evaluated using the Risk of Bias 2.0 (RoB 2.0).

Results: Three studies (n=1,242) met the inclusion criteria. In the first study, 12.5 mg reduces placebo-corrected ABPM SBP by 3.3 mmHg and 25 mg reduces placebo-corrected ABPM SBP by 8.1 mmHg. In the second study, 12.5 mg reduces placebo-corrected ABPM SBP by 4.2

mmHg and DBP by 4.3 mmHg, while 25 mg reduces placebo-corrected ABPM SBP by 5.9 mmHg and DBP by 5.8 mmHg. In the third study, 10 mg reduces placebo-corrected ABPM SBP by 3.99 mmHg and DBP by 4.04 mmHg, 25 mg reduces placebo-corrected ABPM SBP by 4.83 mmHg and DBP by 5.89 mmHg, while 50 mg reduces placebo-corrected ABPM SBP by 3.67 mmHg and DBP by 4.45 mmHg. According to the first study, 50 mg has a lower effect. Aprocitentan has more effect during night and dose up to 25 mg. It isn't affected by artery stiffness and salt concentration. The common adverse event is peripheral edema. One study had low risk of bias and two studies raise concern.

Conclusion: Aprocitentan consistently lowers ambulatory blood pressure in patients with resistant hypertension, with a more prominent result at night.

Keyword: Aprocitentan ; RHTN ; Resistant Hypertension.

PD-052

BMI-ADJUSTED ELECTROCARDIOGRAPHIC CRITERIA FOR IMPROVED DETECTION OF LEFT VENTRICULAR HYPERTROPHY AND CARDIOVASCULAR PROGNOSIS IN OBESE HYPERTENSIVE POPULATION: A META-ANALYSIS

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ABSTRACT

Background: Left ventricular hypertrophy (LVH) is a recognized marker of hypertensive target-organ damage and an important predictor of cardiovascular mortality. Although electrocardiographic (ECG) criteria are widely used for LVH detection, their accuracy is reduced in obese individuals due to attenuation of QRS voltages.

Objectives: To evaluate the diagnostic accuracy of ECG criteria for

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detecting LVH in obese hypertensive patients and to assess their prognostic value for mortality outcomes.

Methods: A comprehensive literature search was performed up to December 2025 using electronic search engines. Pooled sensitivity and specificity were calculated using a bivariate random-effects model. Prognostic outcomes were analyzed using pooled hazard ratios (HRs) with 95% confidence intervals (CIs). I^2 statistics was utilized to identify study heterogeneity. Significant heterogeneity was defined as a P-value <0.05.

Results: Seven studies were included with a total of 21,802 obese hypertensive patients. The pooled sensitivity and specificity of the Cornell voltage criteria were 32% (95%CI 27–37%) and 96% (95%CI 91–98%), respectively. The Sokolow–Lyon criteria showed a pooled sensitivity of 25% (95% CI 20–30%) and a specificity of 96.5% (95%CI 89–99%). Overall, ECG-LVH was not significantly associated with all-cause mortality (HR 1.05; 95%CI 0.69–1.61; $I^2 = 98\%$). Subgroup analysis demonstrated a significant association when LVH was defined using the Cornell criteria (HR 1.26; 95%CI 1.15–1.39), but not with the Sokolow–Lyon criteria. In contrast, ECG-LVH was significantly associated with increased cardiovascular mortality (HR 1.41; 95%CI 1.27–1.58), with consistent findings across both ECG criteria.

Conclusions: Cornell voltage criteria demonstrated higher diagnostic accuracy. Although ECG-LVH was not associated with all-cause mortality, it was consistently associated with increased cardiovascular mortality, supporting its prognostic significance for cardiovascular outcomes.

Keywords: Electrocardiography; Hypertension; Left ventricular hypertrophy; Obesity, Prognosis.

PD-053

Less Time, Lower Pressure: Efficacy of Squat Jump Isometric Resistance Training in Reducing Blood Pressure in Hypertension — A Systematic Review and Meta Analysis

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Background: Hypertension continues to be a leading cardiovascular risk factor, with blood pressure often inadequately controlled despite pharmacological treatment. Although lifestyle modification is fundamental to hypertension management, adherence to exercise programs remains low. Isometric resistance training has emerged as an effective alternative for controlling in both systolic and diastolic blood pressure. Squat jump-based isometric resistance training represents a practical and time-efficient nonpharmacological strategy for managing hypertension.

Objectives: To assess the impact of squat jump-based isometric resistance training on systolic, diastolic, and mean arterial pressure in patients with hypertension.

Methods: A systematic review and meta-analysis were conducted including seven RCTs involving 354 participants to evaluate the effects of squat jump-based isometric resistance training on resting systolic blood pressure, diastolic blood pressure, and mean arterial pressure compared with control conditions. Data were analyzed using Review Manager 5.3.

Results: This meta-analysis included seven studies comprising 354 participants. Compared with control conditions, isometric resistance training using squat jump protocols significantly reduced resting blood pressure. Pooled analyses showed mean reductions of -8.31 mmHg (95% CI: -11.53 to -5.09) in systolic blood pressure, -5.93 mmHg (95%

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CI: -7.52 to -4.34) in diastolic blood pressure, and -7.30 mmHg (95% CI: -9.40 to -5.20) in mean arterial pressure, all of which were statistically significant ($p < 0.00001$) and clinically meaningful.

Conclusions: Isometric resistance training using squat jump protocols produces clinically meaningful reductions in blood pressure and may be considered as an adjunct therapy in patients with hypertension.

Keywords: *Hypertension; Isometric resistance training; Squat jump exercise; Blood pressure reduction; Nonpharmacological therapy.*

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Comparative Effects of Adjunctive Exercise Modalities on Blood Pressure in Older Adults with Hypertension: A Bayesian Network Meta-Analysis

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Abstract

Background: Hypertension is common in older adults and a major contributor to cardiovascular morbidity and mortality; the comparative blood pressure-lowering effects of different exercise modalities remain unclear.

Objectives: To compare the efficacy of adjunctive exercise training modalities in reducing blood pressure among older adults with hypertension.

Methods: Randomized controlled trials (RCTs) were systematically identified from PubMed, Cochrane Library, and Google Scholar through November 9, 2025. A Bayesian random effect model was used to compare aerobic training (AT), resistance training (RT), isometric handgrip training (IHT), and Tai Chi (TC). Interventions were ranked using the surface under the cumulative ranking curve (SUCRA). Meta-regression was conducted to assess age as a potential effect modifier.

Results: Ninety-one RCTs, encompassing 4,938 participants, were included. Across trials, exercise interventions were delivered over 6–48 weeks, with 15–120 min sessions performed 1–7 times/week at low to high intensities. Across modalities, exercise interventions were associated with a trend toward lower systolic (SBP) and diastolic blood pressure (DBP). IHT showed the greatest SBP reduction (MD–8.88 mmHg; 95% CrI –17.40 to –0.28; SUCRA 78.46) compared to control, followed by TC, AT, and RT. IHT also ranked highest in DBP reduction. Estimates were characterized by wide CrI, indicating substantial uncertainty. Meta-regression showed no significant age-related modification of effects on SBP or DBP.

Conclusion: All exercise modalities demonstrated a blood pressure-lowering trend, with IHT showing the greatest potential for reducing SBP and DBP; however, evidence remains insufficient to define optimal exercise intensity and duration.

Keywords: blood pressure; exercise training; hypertension; older adults.

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Finerenone Compared with Classic Mineralocorticoid Receptor Antagonists and the Risk of Hyperkalemia in Chronic Kidney Disease: A Systematic Review

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ABSTRACT

Background: Mineralocorticoid receptor antagonists (MRAs) are commonly prescribed for patients with chronic kidney disease (CKD) and hypertension. Hyperkalemia is a significant safety concern associated with steroidal MRAs. Finerenone, a novel non-steroidal MRA, is suggested to have a better safety profile, but comparative data on hyperkalemia risk is still limited.

Objective: To systematically review and synthesize available evidence comparing the risk of hyperkalemia associated with finerenone versus classic steroidal MRAs in patients with hypertension and CKD.

Method: A search of PubMed, EMBASE, and Cochrane was conducted to identify comparative studies evaluating finerenone versus steroidal MRAs in adults with CKD published within the last five years. Hyperkalemia incidence was the primary outcome, and risk of bias was assessed using the ROBINS-I tool.

Results: Four eligible studies were included. Hyperkalemia was consistently defined as serum potassium ≥ 5.5 mmol/L. Two observational cohort studies reported quantitative effect estimates, demonstrating a lower risk of hyperkalemia with finerenone compared with spironolactone (HR: 0.68–0.78), with confidence intervals not crossing unity. An indirect post-hoc comparison integrating data from the FIDELIO-DKD and AMBER trials, as well as a real-world target trial emulation study, also suggested fewer hyperkalemia events with finerenone, although no

formal effect estimates were reported. Evidence comparing finerenone with eplerenone was limited and suggested potential heterogeneity in risk across different steroidal MRAs.

Conclusion: Available evidence indicates a lower risk of hyperkalemia with finerenone compared with spironolactone in patients with CKD. However, the absence of head-to-head randomized trials and reliance on observational data limit causal inference.

Keywords: finerenone; spironolactone; classic mineralocorticoid receptor antagonists; hyperkalemia; chronic kidney disease.

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Visit-to-Visit Blood Pressure Variability as a Predictor of Major Adverse Cardiovascular Events in Patients with Hypertension: A Systematic Review & Meta-Analysis

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Abstract

Background: Despite a well-controlled mean blood pressure in patients with hypertension, major adverse cardiovascular events (MACE) still frequently occur. Visit-to-visit blood pressure variability (VTV-BPV) has emerged as a potential predictor of MACE, but evidence regarding its prognostic value is heterogeneous and may vary by treatment intensity and population characteristics. An updated systematic review regarding VTV-BPV and its role to predict MACE among hypertensive patients is needed to clarify its role.

Objective: To evaluate visit to visit blood pressure variability as a predictor of MACE among patients with hypertension. **Methods:**

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Systematic search was conducted on 5 databases using keywords related to hypertension, VTV- BPV, and MACE. Studies that match the inclusion criteria were included, and documented using a PRISMA flow diagram. Risk of bias was assessed using the ROBINS-I tool, with disagreements resolved by consensus with a third reviewer.

Results: In the pooled analysis, increased VTV-BPV was significantly associated with a higher risk of MACE. When BPV was measured using the CV, there was a 28% increase in risk (HR 1.28; 95% CI: 1.01–1.61), while measurement using SD showed a 25% increase in risk (HR 1.25; 95% CI: 1.04–1.50). Although significant heterogeneity was observed among the included studies, the direction of the findings was consistent.

Conclusions: Higher VTV-BPV is associated with an increased risk of MACE in patients with hypertension. These findings support the clinical relevance of BPV assessment, while further prospective studies are warranted to clarify standardized measurement approaches and to explore whether reducing BPV may improve cardiovascular outcomes.

Keywords: Blood Pressure Variability, Visit to visit, Hypertension, MACE.

PD-057

Impact of Hypertensive Disorders of Pregnancy on Offspring Cardiac Function: A Systematic Review and Meta-Analysis

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Introduction: Hypertensive disorders of pregnancy (HDP) occur in a substantial proportion of pregnancies and may have long-term implications for cardiac remodeling or dysfunction in the offspring later

in life. However, individual studies have reported inconsistent results, highlighting the need for a systematic synthesis to assess whether HDP is associated with changes in offspring cardiac function relative to normotensive pregnancies.

Objective: To examine whether HDP is associated with altered cardiac function in offspring compared with normotensive pregnancies.

Methods: A literature search was conducted in PubMed, ScienceDirect, Google Scholar, and Scopus. Original studies reporting cardiac function in offspring born to mothers with hypertensive disorders of pregnancy, compared with normotensive pregnancies, were analyzed. Quality was assessed using the Newcastle–Ottawa Scale. Meta-analyses were conducted in R(v4.3.2), using fixed-effects models ($I^2 < 50\%$) or random-effects models ($I^2 \geq 50\%$).

Result: A systematic search identified fifteen eligible studies ($n = 5,106$) assessing cardiac function in offspring of mothers with HDP compared with offspring of normotensive mothers. Pooled analyses showed a lower tricuspid E/A ratio in the exposed group [MD -0.08 (-0.16; -0.01); $p = 0.0297$]. Other cardiac parameters showed no significant differences, including LV-MPI [MD 0.01 (-0.03; 0.06); $p = 0.5119$], GLS [MD 0.81 (-1.13; 2.75); $p = 0.4134$], EF [MD -0.24 (-1.20; 0.71); $p = 0.6172$], FS [MD -0.33 (-2.17; 1.51); $p = 0.7260$], LVEDV [MD 0.30 (-2.18; 2.78); $p = 0.3240$], RWT [MD 0.03 (-0.10; 0.08); $p = 0.5119$], and mitral E/A ratio [MD 0.00 (-0.03; 0.03); $p = 0.9988$].

Conclusion: HDP is associated with a reduction in the offspring tricuspid E/A ratio, indicating altered right-sided diastolic filling, whereas other measures of cardiac function showed no significant differences. This finding should be interpreted with caution due to heterogeneity in offspring age at assessment and the type of hypertensive disorder across studies.

Keywords: hypertensive disorders of pregnancy; meta-analysis; cardiac function.

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Table 1. Pooled effect estimates for offspring cardiac function parameters following hypertensive disorders of pregnancy compared with normotensive pregnancies.

Cardiac Function	n	Model	I ²	MD	CI	p-value
LV-MPI	6	RE	79.8%	0.01	-0.03; 0.06	0.5119
GLS	5	RE	90.6%	0.81	-1.13; 2.75	0.4134
EF	13	RE	57.7%	-0.24	-1.20; 0.71	0.6172
FS	5	RE	76.4%	-0.33	-2.17; 1.51	0.7260
LVEDV	4	FE	28.4%	0.30	-2.18; 2.78	0.3240
RWT	4	RE	75.1%	0.03	-0.1; 0.08	0.5119
Mitral E/A Ratio	9	FE	0%	0.00	-0.03; 0.03	0.9988
Tricuspid E/A Ratio	3	FE	0.0%	-0.08	--0.16; -0.01	0.0297

LVMPI = left ventricular myocardial performance index; GLS = global longitudinal strain; EF = ejection fraction; FS = fractional shortening; LVEDV = left ventricular end-diastolic volume; RWT = left ventricular relative wall thickness.

PD-058

The Effects of Light Exposure (Both Natural & Artificial) on Blood Pressure: A Systematic Review

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Background: Light exposure, whether natural or artificial sources, has been linked to changes in blood pressure through its effects on blood vessels. In recent years, several studies have looked at how different types of light, such as ultraviolet and blue light, may affect the blood

pressure. However, the findings are spread across different study designs and have not been clearly summarized.

Objective: This systematic review aims to evaluate the evidence of the effects of natural and artificial light exposure on blood pressure.

Methods: Studies were extracted using electronic databases such as PubMed, Europe PMC, and AHA Journals on 19 December 2025. Studies were identified using keywords “light exposure,” “ultraviolet,” “UVA,” “blue light,” and “blood pressure.” Human randomized controlled trials, experimental studies, and observational cohort studies were included; systematic reviews, animal studies, and case reports were excluded. Study selection and data extraction were performed by three independent reviewers. Study quality was assessed using RoB 2 and ROBINS-E. Interventional studies applied controlled light exposure sessions of approximately 20–30 minutes daily, while observational studies assessed ambient solar ultraviolet radiation as an indicator of long-term exposure without individual duration measurement.

Results: Four studies met inclusion criteria. Artificial light exposure such as UVA phototherapy and blue light exposure generally reduced systolic blood pressure and improved vascular or endothelial function. The observational study found higher levels of natural solar ultraviolet radiation were associated with lower systolic blood pressure after accounting for ambient temperature. Risk of bias ranged from low to moderate, with confounding as the main limitation.

Conclusion: Both natural and artificial light exposure appear to have beneficial effects on blood pressure. Interventional studies suggest a direct effect, while observational findings support environmental influences. However, more studies are needed to determine clinical relevance.

Keywords: Artificial Light, Natural Light, Light Exposure, Blood Pressure

Target Organ Damage in Masked and White Coat Hypertension: A Systematic Review and Meta- Analysis

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Abstract

Background: Masked hypertension (MH) and white-coat hypertension (WCH) are blood pressure phenotypes identified through out-of-office monitoring. Although both are linked to increased cardiovascular risk, their relative burden of target organ damage (TOD) remains uncertain.

Objectives: To evaluate and compare cardiac, vascular, and renal TOD in individuals with MH and WCH.

Methods: A systematic review and meta-analysis were conducted according to PRISMA 2020 guidelines. PubMed, ProQuest, Cochrane, and ScienceDirect were searched for studies assessing TOD using ambulatory or home blood pressure monitoring. Outcomes included left ventricular mass index (LVMI), left ventricular hypertrophy (LVH), pulse wave velocity (PWV), carotid intima-media thickness (cIMT), estimated glomerular filtration rate (eGFR), and microalbuminuria. Random-effects models were applied. Risk of bias was assessed using the Joanna Briggs Institute checklist and the Newcastle-Ottawa Scale.

Results: Twenty-six studies were included. Compared with normotension (NT), WCH was associated with higher odds of microalbuminuria (OR 1.85), LVH (OR 1.71), and increased PWV (MD 0.94 m/s), while eGFR and LVMI showed nonsignificant differences. MH demonstrated greater TOD versus NT, including reduced eGFR (MD -5.05 mL/min/1.73m²), higher LVMI (MD 9.48 g/m²), higher PWV (MD 1.06 m/s), greater cIMT (MD 0.06 mm), and higher microalbuminuria (OR 1.79). In direct comparison,

MH exhibited higher LVMI than WCH (MD 0.34 g/m²), with moderate heterogeneity.

Conclusions: MH is associated with a greater burden of cardiac, vascular, and renal TOD than NT and more pronounced cardiac involvement than WCH; however, WCH is also associated with subclinical organ damage, supporting routine out-of-office blood pressure monitoring for risk stratification.

Keywords: Masked hypertension; White-coat hypertension; Target organ damage.

PD-060

Risk Factors for Postpartum Hypertension Within One Year After Delivery: A Meta-Analysis

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ABSTRACT

Background: Postpartum hypertension is an important contributor to pregnancy-related morbidity and mortality worldwide. It is associated with serious maternal cardiovascular complications. In addition, limited postpartum medical follow-up and the asymptomatic presentation of many patients contribute to underrecognition of postpartum hypertension. In this context, a better understanding of risk factors for postpartum hypertension is crucial for detecting high-risk women early on and optimizing postpartum care.

Objective: To evaluate the risk factors associated with postpartum hypertension.

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Method: This study followed the PRISMA guidelines. Eligible studies were identified through searches of PubMed, Scopus, and EBSCOhost. The meta-analysis was conducted using Review Manager, with mean differences (MDs) calculated for continuous outcomes and odds ratios (ORs) for dichotomous outcomes, each reported with 95% confidence intervals (CIs). Statistical heterogeneity was evaluated using the I^2 statistic.

Results: Sixteen studies were included in the meta-analysis. Obesity (OR 2.23, 1.63–3.06, $P < 0.00001$), higher pre-pregnancy body mass index (MD 3.82 kg/m², 2.68–4.95, $P < 0.00001$), family history of hypertension (OR 2.13, 1.18–3.84, $P = 0.01$), gestational hypertension (OR 1.98 1.02–3.86, $P = 0.04$), and advanced maternal age (>35 years) (OR 1.89, 1.48–2.42, $P < 0.00001$) were significantly associated with postpartum hypertension. Women with postpartum hypertension were also older on average (MD 1.75 years, 1.14–2.35). In contrast, overweight status, smoking, preeclampsia, eclampsia, and cesarean delivery were not significantly associated with postpartum hypertension; however, substantial heterogeneity was observed in several analyses.

Conclusion: Obesity, higher pre-pregnancy body mass index, family history of hypertension, gestational hypertension, and advanced maternal age are key factors associated with postpartum hypertension, highlighting the need for targeted postpartum blood pressure surveillance among high-risk women.

Keywords: Hypertension, post-partum, maternal, post-delivery, risk factors

PD-061

BREAKING THE SEDENTARY CYCLE AT WORK: A META-ANALYSIS OF SIT-TO-STAND WORKSTATIONS' EFFECTS ON BLOOD PRESSURE AND CARDIOMETABOLIC HEALTH**Cindy Lawrence¹, Rafael R. A. Sitanggang², Putu Wecan³,
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Background: The global workforce is increasingly affected by chronic diseases, particularly hypertension and cardiovascular conditions. Prolonged sedentary behavior during working hours is a major contributor, yet evidence from secondary studies remains limited.

Objective: This meta-analysis evaluated the effects of sit-to-stand workstations on blood pressure, sitting time, and cardiometabolic markers in office workers.

Methods: A systematic search of randomized controlled trials was conducted in PubMed, ScienceDirect, Scopus, EBSCOhost, and the Cochrane Library following PRISMA guidelines. Primary outcomes were systolic and diastolic blood pressure (SBP and DBP), while secondary outcomes included daily sitting time, HDL cholesterol (HDL-C), body mass index (BMI), fasting glucose, and HbA1c. Meta-analyses were performed using RevMan 5.4, and risk of bias was assessed with Cochrane RoB 2.0 tool.

Results: Ten studies involving 1,758 workers showed sit-to-stand workstations significantly reduced sitting time (-55.9 min/day [-74.2 to -37.7; $p < 0.00001$]) and modestly lowered SBP (-1.53 mmHg [-3.00 to -0.06; $p = 0.04$]). DBP, HbA1c, and BMI improvement were non-significant. Other benefits included higher HDL-C (+0.05 mmol/L [0.02 to 0.09; $p = 0.004$]) and lower fasting glucose (-0.13 mmol/L [-0.23 to -0.03; $p = 0.01$]), indicating a more favorable cardiometabolic profile.

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Conclusion: Sit-to-stand workstations reduce sitting time and improve SBP, HDL-C, and fasting glucose, suggesting potential prevention of hypertension and cardiometabolic risk. Their feasibility and scalability make them a practical non-pharmacological workplace intervention, although longer-term studies are warranted.

Keywords: *sit-to-stand workstation, office workers, sedentary, blood pressure, cardiometabolic risk*

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Association of the Weight-Adjusted Waist Index with Hypertension: A Systematic Review and Meta Analysis

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Abstract

Background: The weight-adjusted waist index (WWI) is a novel anthropometric indicator reflecting central adiposity independent of body weight, calculated as waist circumference (cm) divided by the square root of body weight (kg). Emerging evidence suggests an association between WWI and hypertension; however, results across studies remain inconsistent.

Objectives: to systematically evaluate the association between WWI and the risk of hypertension.

Methods: A systematic literature search was conducted in accordance with PRISMA guidelines to identify observational studies assessing the association between WWI and hypertension. Pooled odds ratios

were calculated using inverse-variance random-effects models for WWI analysed as both continuous and categorical variables. Between-study heterogeneity was assessed using the I^2 statistic. Analyses were performed using Review Manager (v5.4.1), and risk of bias was evaluated using the Newcastle–Ottawa Scale.

Results: Seven observational studies were included, comprising one case–control study, five cross-sectional studies, and one cohort study. Each one-unit increase in WWI was associated with a significantly higher risk of hypertension (OR 1.39, 95% CI 1.21–1.60, $p < 0.00001$; $I^2 = 95\%$). Individuals in the highest WWI category had a significantly increased risk of hypertension compared with those in the lowest category (OR 2.14, 95% CI 1.67–2.74, $p < 0.0001$; $I^2 = 91\%$). The risk of bias assessment indicated low-to-moderate study quality.

Conclusion: Both continuous and categorical analyses demonstrated a significant association between WWI and hypertension, supporting a consistent relationship between increasing central adiposity and elevated hypertension risk. Further well-designed prospective studies are needed to confirm these findings.

Keywords: blood pressure; hypertension; WWI; weight-adjusted waist index.

PD-063

Efficacy and Safety of Potassium-Enriched Salt Substitution for Blood Pressure Reduction: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Background: Globally, excessive sodium intake is a major driver of hypertension and cardiovascular disease. Potassium-enriched salt substitutes represent a promising intervention, simultaneously lowering sodium and boosting potassium intake to reduce blood pressure. However, a critical evidence gap exists regarding their overall efficacy and safety profile.

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Objective: To determine the efficacy and safety profile of potassium-enriched salt substitution compared to regular salt or usual care on adults, irrespectively with their hypertension status

Method: A systematic review and meta-analysis were conducted using studies from GoogleScholar, PubMed, ScienceDirect, Epistemonikos and Scopus adhering to PRISMA 2020 guidelines. Outcomes assessed are systolic (SBP), diastolic blood pressure (DBP) and heart rate (HR) changes as primary outcomes, analysed using mean difference (MD) with 95% confidence intervals (CI). Secondary outcomes such as renal function-electrolyte related markers, analysed using standardized mean difference (SMD) with 95% CI and body weight were also assessed for safety profile, all pooled using a random-effects model. Publication bias assessments were conducted using funnel plots. All were analysed using RevMan 5.4.

Result: 20 randomized controlled trials (RCTs) comprising 23,474 adults were included in the analysis. Compared with regular salt or usual care, potassium-enriched salt substitution significantly reduced SBP (MD: -6.94 mmHg; 95% CI: -10.66 to -3.23; $p < 0.001$) and DBP (MD: -3.70 mmHg; 95% CI: -5.57 to -1.82; $p < 0.001$), although substantial heterogeneity was observed ($I^2 = 98\%$). It also led to a significant improvement in sodium-potassium balance, reflected by a lower urinary Na/K ratio (SMD: -0.69; 95% CI: -1.07 to -0.31; $p < 0.001$; $I^2 = 85\%$). There were no significant changes in HR, body weight, renal function and other electrolyte-related biomarkers.

Conclusion: Potassium-enriched salt substitutes significantly reduce blood pressure while improving sodium and potassium balance, with no significant adverse effects on body weight, renal function and electrolyte homeostasis, indicating a favorable overall safety profile.

Keyword: *Blood Pressure; Hypertension; Meta-Analysis; Potassium-Enriched; Sodium-Restricted*

PD-064

Efficacy and Safety of Aldosterone Synthase Inhibitors for Uncontrolled or Resistant Hypertension: A Bayesian Network Meta-analysis of Randomized Controlled Trials

Background: Hypertension remains a leading contributor to global cardiovascular morbidity and mortality, with a substantial proportion of patients exhibiting uncontrolled or resistant despite multidrug therapy. Aldosterone-driven sodium retention and vascular dysfunction play a central role in persistent blood pressure elevation, positioning aldosterone synthase inhibitors (ASIs) as a promising therapeutic strategy.

Objective: To systematically compare the efficacy and safety profiles of different ASIs agents, for uncontrolled or resistant hypertension management.

Method: A Bayesian network meta-analysis used studies from GoogleScholar, PubMed, EBSCO, Epistemonikos and Cochrane adhering to PRISMA 2020 guidelines. Several ASIs agents, including osilodrostat, lorundrostat, baxdrostat, and vicadrostat were compared against placebo. Outcomes assessed are change in systolic (SBP) and diastolic blood pressure (DBP) as efficacy profile, analysed using mean-difference (MD) with 95% credible intervals (CrIs), alongside their safety profile, including serious and non-serious adverse events (AEs), mortality, hyponatremia, hyperkalemia and adrenal insufficiency events, analysed using risk-ratio (RR) with 95% CrIs. Interventions were ranked using SUCRA, and risk of bias was assessed using the Cochrane RoB 2.0 tool.

Result: Eight randomized controlled trials (RCTs) comprising 3,168 populations were included. Lorundrostat demonstrated the highest reduction, both in SBP (MD : -7.58 mmHg, 95% CrI : -10.8 to -4.27) and DBP (MD : -3.65 mmHg, 95% CrI : - 4.85 to -2.42). Furthermore, baxdrostat and osilodrostat both showed significant reduction in blood

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pressure compared to placebo. Lorundrostat showed lowest serious AEs (RR : 0.53, 95% CrI : 0.126 to 1.93), while osilodrostat posed the lowest risk of non-serious adverse events and hyperkalemia, baxdrostat showed the lowest mortality risk, and vicadrostat showed the lowest adrenal insufficiency risk.

Conclusion: ASIs, especially lorundrostat, demonstrated effective blood pressure reduction. However, their safety profile remains inconclusive, thus warranting careful clinical monitoring and further validation through large-scale and well-powered clinical trials.

Keyword: *Aldosterone Synthase Inhibitors; Bayesian Network Meta-Analysis; Blood Pressure; Lorundrostat; Uncontrolled Hypertension*

PD-065

Mind Over Pressure: Comparative Effectiveness of Stress Management Interventions for Blood Pressure Reduction in Adults - A Bayesian Network Meta-Analysis of Randomized Controlled Trials

Background: Hypertension is a primary global driver of cardiovascular disease, affecting one in three adults worldwide. While pharmacotherapy is standard, chronic stress contributes significantly to blood pressure (BP) elevation, making stress management a vital non-pharmacological target. However, the comparative efficacy of different stress-reduction techniques remains unclear.

Objective: To systematically compare and rank the efficacy of stress management interventions for reducing BP in adults.

Method: A Bayesian network meta-analysis used data from PubMed, GoogleScholar, ScienceDirect, Epistemonikos and Cochrane, following PRISMA 2020 guidelines. Several interventions, including

transcendental meditation, yoga, breathing control techniques, music, mindfulness-based stress reduction (MBSR), progressive muscle relaxation, relaxation response training and combination therapies were assessed against usual care and health education. Outcomes assessed were change in systolic (SBP), diastolic BP (DBP) and heart rate (HR). Calculations were conducted in MetaInsight (v6.4.0) using a random-effects model with mean difference (MD) and 95% credible intervals (CrIs), while SUCRA was used in ranking interventions. Publication bias was assessed using the Cochrane RoB 2.0 tool.

Result: Sixty-three RCTs, comprising 5,618 populations were included. Combination of MBSR and yoga posed the greatest reduction in SBP (MD: -19.40 mmHg; 95% CrI: -33.4 to -5.5) and DBP (MD: -6.34 mmHg; 95% CrI: -14.8 to 2.13), followed by MBSR in SBP (MD: -9.2 mmHg; 95% CrI: -14.2 to -4.5) and DBP (MD: -3.83 mmHg; 95% CrI: -6.77 to -1.05). MBSR showed the highest reduction in HR (MD: -6.49 bpm; 95% CrI: -14.4 to 0.904), followed by music (MD: -4.64 bpm; 95% CrI: -10.2 to 0.947) and yoga (MD: -4.36 bpm; 95% CrI: -7.75 to -0.909).

Conclusion : MBSR and yoga emerged as the superior non-pharmacological interventions in reducing BP and HR, supporting their implementation into comprehensive strategies in managing hypertension.

Keyword: *Hypertension, Blood Pressure, Relaxation Therapy, Mind-Body Therapies, Non-pharmacological Therapy.*

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PD-066

Comparative Efficacy of Aerobic Exercise, Dynamic Resistance, Isometric Resistance, and Combination for Blood Pressure Reduction in Hypertension: A Bayesian Network Meta-Analysis of Randomized Controlled Trials

Introduction: Hypertension affects an estimated 1.4 billion people worldwide and remains a leading cause of cardiovascular morbidity and mortality. While pharmacological therapy is central to management, its effectiveness is often limited by suboptimal control, adverse effects, and poor adherence. However, a current lack of comparative evidence between exercise modalities persists, hindering the development of optimized, evidence-based prescriptions for hypertension.

Objective: To comprehensively compare the effect of aerobic, isometric, dynamic, and combined exercise modalities on blood pressure (BP) and other cardiometabolic outcomes.

Methods: Aligning to the PRISMA-NMA guidelines, randomized controlled trials (RCTs) were identified from Cochrane, Scopus, Google Scholar, PubMed, and Epistemonikos. Primary outcomes were changes in systolic (SBP) and diastolic BP (DBP). Secondary outcomes included heart rate (HR), body weight (BW), body mass index (BMI), and maximal oxygen uptake (VO_2 max). Publication bias was assessed with RoB 2.0, and Bayesian network meta-analysis was conducted in MetaInsight (v.6.4.0) under a random-effects model, reporting mean difference (MD) and 95% credible intervals (CrIs), while SUCRA was used in ranking interventions.

Results: 98 RCTs involving 6,338 participants were analyzed. Aerobic-dynamic exercise posed the greatest reduction both in SBP (MD: -11.60 mmHg; 95% CrI: -14.7 to -8.49) and DBP (MD: -7.39 mmHg; 95% CrI: -9.62 to -5.13), both followed by dynamic-isometric combination, with MD: -10.4 mmHg; 95% CrI: -17.5 to -3.13 and MD: -6.01 mmHg; 95% CrI: -11 to -1.02, respectively. Aerobic-dynamic exercise combinations

also showed the greatest reduction in BW and BMI, while aerobic exercise alone achieved the greatest reduction in HR and improvement in VO_2 max.

Conclusion: Aerobic-dynamic exercise combination provides the most consistent benefits across cardiometabolic outcomes, supporting its use as an effective exercise strategy in hypertension management.

Keywords: *Aerobic Exercise; Bayesian Network Meta-analysis; Dynamic Exercise; Hypertension; Isometric Resistance.*

PD-067

Nocturnal Blood Pressure Dipping Patterns and Progression of Chronic Kidney Disease: A Systematic Review

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Background: Chronic kidney disease (CKD) is a major global health problem, and hypertension is a key modifiable risk factor for its progression. Ambulatory blood pressure monitoring (ABPM) assesses nocturnal blood pressure dipping, which is associated with target organ damage, but its relationship with renal outcomes remains conflicting.

Objective: This systematic review aims to analyze the association between nocturnal blood pressure dipping patterns and renal function in CKD patients with particular emphasis on the hypertension status.

Method: 2 individuals independently searched the PubMed, EuropePMC and Cochrane library database with the search term "nocturnal blood pressure" AND "dipping" AND "chronic kidney disease" up to 17 January 2026. Randomised controlled trials, cohort studies and clinical trials evaluating the association of dipping patterns and estimated glomerular

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filtration rate (eGFR) decline in patients with CKD were included. Systematic review, meta-analysis and trials on animals were excluded. Risk of bias was assessed using the ROBINS-E tool.

Result: 4 studies with low risk of bias, comprising a total of 3,839 patients, were included. Park et al., 2024 and Cho et al., 2021 concluded that patients with non-dipping and reverse-dipping profiles were associated with CKD progression and reduced kidney function. Ida et al., 2019 and Kado et al., 2019 found that among normotensive CKD patients, non-dipping blood pressure patterns were not associated with accelerated eGFR decline.

Conclusion: In conclusion, overall blood pressure is a stronger determinant of kidney disease progression than the circadian blood pressure rhythm. However, further studies are needed to clarify whether dipping status serves as a meaningful risk marker.

Keywords: dipping; chronic kidney disease; nocturnal blood pressure

PD-068

The Association Between Post-procedural Blood Pressure Parameters and Malignant Brain Edema in Ischemic Stroke Patients Undergoing Reperfusion Therapy: A Systematic Review

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Introduction: Blood pressure (BP) management is a critical determinant of outcomes in acute ischemic stroke patients following reperfusion therapy. Poorly controlled post-procedural BP can exacerbate blood-brain barrier (BBB) permeability, potentially precipitating malignant brain edema (MBE).

Objective: This study investigates the association between post-procedural BP parameters and MBE incidence in this high-risk population.

Methods: A systematic search was conducted across PubMed, Scopus, and ScienceDirect until December 2025. Observational studies and clinical trials investigating BP management and MBE post-reperfusion were included. Quality was appraised using NOS and RoB 2 tools. Data were extracted and synthesized narratively to facilitate a comparative analysis.

Results: From 467 records, six studies met the inclusion criteria. Observational data indicated that maintaining systolic blood pressure (SBP) below 160-165 mmHg is significantly protective against MBE (OR: 0.32, 95% CI: 0.20–0.52; OR: 0.2, 95% CI: 0.05-0.7). Conversely, a mean arterial pressure (MAP) drop >40% posed a significant hazard (OR: 3.90, 95% CI: 1.67–9.04). While RCTs of aggressive SBP targets (<130 or 130–140 mmHg) showed neutral results, more stringent targets (<140 mmHg) were associated with increased hazard (OR: 7.88, 95% CI: 1.57–39.39).

Conclusion: This review identifies a "U-shaped" therapeutic window for post-reperfusion BP. While moderate control is neuroprotective, both hypertension and aggressive hypotension may compromise BBB integrity. These findings underscore the need for further high-quality evidence to optimize clinical hemodynamic protocols.

Keyword: Blood pressure; Malignant Brain Edema; Reperfusion Therapy; Stroke;

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PD-069

The Efficacy of Combined Bromelain-Based Debridement, Hydrogel Application, and Low-Level Laser Therapy in the Management of Chronic Venous Leg Ulcers: Network Meta-Analysis

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Background: Chronic venous leg ulcers (VLU) pose a clinical and economic burden due to their prevalence and resistance. Standard debridement is limited. This study assesses a new synergistic approach: rapid enzymatic debridement (bromelain-based), hydrogel for autolytic debridement, and low-level laser therapy (LLLT) for tissue regeneration.

Objective: To evaluate and compare the effectiveness of bromelain-based enzymatic debridement, hydrogel autolytic debridement, and low-level laser therapy (LLLT) on wound healing outcomes in chronic venous leg ulcers relative to placebo using evidence from randomized controlled trials.

Methods: We conducted a comprehensive search through PubMed, Google Scholar, ScienceDirect, NEJM, Wiley, and Clinicaltrials.gov. According to PRISMA, 4 randomized controlled trials fit the inclusion criteria from 22 studies found. Biases were assessed using Cochrane RoB 2.0. Effect estimates were pooled using NMAstudio. Based on PROSPERO, this study hasn't been registered yet.

Results: The results table demonstrates that low-level laser therapy (LLLT) is the most effective treatment. Total patients of all 4 studies are 381 patients. Wound areas in cm^2 , measured after the treatment duration, were used as the unit of comparison against a placebo for each treatment. Our findings indicate that Alginate was less effective than placebo, showing a reduction in wound healing by -0.2 ± 0.9 (95% CI; $-1.15-0.67$). Hydrogel yielded better results, with an improvement of

0.42±0.9 (95% CI; 0.44-1.28). Bromelain-based enzymatic debridement followed with an improvement of 2.9±22.3 (95% CI; -19.44-25.24) LLLT showed the best performance, improving wound healing by 4.88±0.9 (95% CI; 4.01-5.75) compared to the placebo.

Conclusions: Among the evaluated interventions, low-level laser therapy (LLLT) demonstrated the most significant improvement in wound healing for chronic venous leg ulcers compared to placebo. It was substantially more effective than bromelain-based debridement and hydrogel, while alginate was found to be less effective than placebo. These findings position LLLT as a superior therapeutic strategy for managing VLU.

Keywords: *Venous Leg Ulcer; Bromelain-based enzymatic debridement; Low-level laser therapy; Hydrogel; Vascular Medicine.*

PD-070

Unmasking the Antihypertensive Effects of CPAP Treatment in Patients with Obstructive Sleep Apnea (OSA) and Resistant Hypertension (RH): A Systematic Review and Meta-Analysis of Randomized Controlled Trials (RCTs)

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Introduction: Hypertension is highly prevalent in patients with OSA and has been associated with cardiovascular complications. Treatment of OSA with CPAP is indicated as an adjunctive therapy to lower blood pressure. However, the effect of CPAP on blood pressure in patients with OSA and RH needs further research.

Objective: To evaluate the effect of CPAP treatment on 24-hour, daytime, and nighttime blood pressure in patients with OSA and RH.

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Method: A systematic search of RCT studies was conducted in PubMed and Scopus up to January 2026. Studies were eligible if participants had moderate-to-severe OSA, defined by an apnea-hypopnea index (AHI) ≥ 15 events/h, and RH, defined as uncontrolled systolic blood pressure (SBP ≥ 140 mmHg) and/or diastolic blood pressure (DBP ≥ 90 mmHg), despite taking at least three classes of anti-hypertensive drugs. A random-effects model was used to calculate weighted mean differences (WMDs) and 95% confidence intervals (CIs).

Result: Seven RCTs published between 2010 and 2021 were included, involving 701 participants. Participants were randomized into the CPAP group and the non-CPAP/sham CPAP group. Meta-analysis showed that CPAP significantly reduced 24-hour SBP (WMD: -2.33 mmHg, $p=0.02$), 24-hour DBP (WMD: -2.18 mmHg, $p=0.003$), nighttime SBP (WMD: -3.83 mmHg, $p=0.0006$), and nighttime DBP (-2.39 mmHg, $p=0.004$). However, reductions in daytime SBP (WMD: -0.63 mmHg, $p=0.55$) and daytime DBP (WMD: -1.25 mmHg, $p=0.12$) were not statistically significant. CPAP reduced blood pressure at both 3- and 6-month evaluations.

Conclusion: In patients with OSA and RH, CPAP treatment is associated with reductions in SBP and DBP.

PD-071

Efficacy and Safety of Baxdrostat versus Spironolactone in Treatment-Resistant Hypertension: A Systematic Review

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Background: Treatment-resistant hypertension (TRH), affecting 10-20% of hypertensive patients, remains challenging despite multidrug therapy (renin-angiotensin system blocker, calcium channel blocker and diuretic) and is often driven by excess aldosterone. Consequently,

spironolactone is the preferred fourth-line treatment targeting aldosterone excess. Baxdrostat, a selective aldosterone synthase (CYP11B2) inhibitor, lowers aldosterone while sparing cortisol, offering a targeted alternative supported by recent mechanistic and pharmacologic data.

Objective: To compare the efficacy and safety of Baxdrostat versus spironolactone in adults with TRH.

Methods: A systematic search (Dec 5, 2025) of PubMed, ScienceDirect, and Cochrane Library using keywords: “baxdrostat,” “spironolactone,” “aldosterone synthase inhibitor,” and “treatment-resistant hypertension.” Which included clinical trials and randomized controlled trials, while systematic reviews, meta-analyses and case reports were excluded. Bias was assessed using RoB 2.0 and ROBINS-I. Outcomes included systolic blood pressure (SBP) changes and adverse events.

Results: Three studies met inclusion criteria (n=583): Phase 2 Baxdrostat RCT, Phase 3 Baxdrostat clinical trial, and PATHWAY-2 spironolactone RCT. Baxdrostat produced dose-dependent SBP reductions, while spironolactone achieved greater overall SBP lowering, confirming superior antihypertensive efficacy. Baxdrostat was associated with moderate adverse events (headaches, dizziness, fatigue) with no treatment-related deaths. Spirolactone carried a higher risk of hyperkalemia without excess mortality. Bias assessment indicated mild-moderate risks for Baxdrostat trials and moderate risk for spironolactone due to crossover and partially open-label design.

Conclusion: Both treatments effectively reduced blood pressure in TRH. Spironolactone showed greater efficacy in SBP reductions, whereas Baxdrostat provides a safer alternative. However, long-term RCTs are needed to establish comparative durability and safety.

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PD-072

Sugar-Sweetened Beverages as a Modifiable Risk Factor for Pediatric Hypertension: A Systematic Review and Meta-Analysis

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Background: Sugar-sweetened beverage (SSB) consumption remains common among children and adolescents worldwide and has increased substantially over recent decades. At the same time, pediatric hypertension is increasingly recognized as an early cardiovascular risk factor with important long-term consequences. Clarifying the association between SSB intake and pediatric cardiometabolic outcomes is essential to inform early, modifiable prevention strategies.

Objective: To systematically evaluate and quantify the association between sugar-sweetened beverage consumption and the risk of pediatric hypertension and related cardiometabolic outcomes.

Method: A systematic search of PubMed, Scopus, and ScienceDirect was conducted from database inception through 2025 to identify observational studies assessing SSB consumption among children and adolescents aged 2–18 years. Eligible cross-sectional and cohort studies reporting adjusted effect estimates were included. Risk of bias was assessed using ROBINS-I. Adjusted odds ratios (ORs) were pooled using Review Manager with the generic inverse variance method under a random-effects model. Heterogeneity was assessed using the I^2 statistic.

Result: Ten observational studies from diverse geographic regions were included, with four studies eligible for quantitative pooling of hypertension outcomes. Higher SSB intake was associated with increased odds of pediatric hypertension, with a pooled OR of 1.22 (95% CI 0.89–1.67), indicating a 22% higher odds compared with lower

intake; however, this association did not reach statistical significance ($p = 0.21$). Substantial heterogeneity was observed ($I^2 = 81\%$). Secondary analyses demonstrated a borderline association with abdominal obesity (OR 1.66; 95% CI 0.95–2.89; $p = 0.07$; $I^2 = 84\%$) and a small, non-significant increase in triglyceride levels (SMD 0.12; 95% CI -0.02 to 0.26; $p = 0.09$; $I^2 = 77\%$).

Conclusion: Higher SSB consumption may be associated with increased cardiometabolic risk in children and adolescents, particularly for hypertension and abdominal obesity, although findings remain statistically inconclusive due to substantial heterogeneity and limitations of observational studies. These results support early, personalized dietary interventions to reduce SSB intake as part of cardiovascular risk prevention in pediatric populations.

Keywords: *Pediatric Hypertension; Sugar-Sweetened Beverage; Children and Adolescents; Blood Pressure*

PD-073

Aspirin vs Metformin in Prevention of Pre-eclampsia: A Network Meta-Analysis

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Background: Preeclampsia affects 2-8% of pregnancies globally and is a leading cause of maternal and perinatal morbidity and mortality. Current prevention relies on early risk identification and prophylaxis. While low-dose aspirin is the established standard, metformin has recently emerged as a promising alternative for risk mitigation.

Objective: This analysis aims to systematically evaluate the comparative

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efficacy and safety of aspirin and metformin for preeclampsia prophylaxis.

Methods: Literature was obtained from several databases, namely PubMed, Scopus, ScienceDirect, Springer, Sage, and Proquest, then screened using the inclusion and exclusion criteria. Study quality was assessed using the Cochrane Risk of Bias 2.0 tool. A random-effects network meta-analysis was subsequently performed using R statistical software.

Results and Discussions: Twenty-four studies with a total of 28,860 participants were included in the network meta-analysis. We analyze RCTs comparing aspirin or placebo (18 studies) and metformin or placebo (6 studies). Results show that aspirin is slightly more effective in preventing preeclampsia than metformin (OR = 0.86; 95% CI [0.701; 1.061]), although the difference was insignificant. Aspirin is also showing slightly lower results in perinatal death, preterm delivery, and postpartum hemorrhage in comparison with metformin.

Conclusion: Within the limitations of the present study design, the use of aspirin in preventing preeclampsia is slightly more effective than metformin. However, the difference of beneficial effect between those two could be non-significant, due to heterogeneity and low quality of current evidence.

Keywords: *Aspirin, Metformin, Pre-eclampsia, Pregnancy.*

PD-074

Comparative Effectiveness of Dual Versus Triple Single-Pill Combination Therapy in Blood Pressure Reduction: A Systematic Review and Meta-Analysis

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Background: Hypertension remains difficult to control in many patients in Indonesia, with a prevalence of 30.8% among adults aged ≥ 18 years, particularly among those requiring combination therapy. Dual and triple single-pill combination therapies are commonly used strategies to achieve blood pressure targets. However, their comparative effectiveness in reducing systolic and diastolic blood pressure remains unclear. This question is clinically relevant in real-world settings, where imperfect adherence and missed doses may influence blood pressure control.

Objective: To compare the effectiveness of dual versus triple single-pill combination therapy in reducing systolic and diastolic blood pressure.

Methods: We systematically searched PubMed, Scopus, and Cochrane for randomized controlled trials comparing triple versus dual single-pill combination therapy in patients with hypertension. Non-randomized studies, studies without quantitative blood pressure outcomes, and non-English or Indonesian articles were excluded. The included studies were screened using Rayyan AI and meta-analysis was performed using the Meta-Analysis Online platform (metaanalysisonline.com).

Results: A meta-analysis of 6 RCTs involving 3,361 participants (1,708 intervention; 1,653 control) demonstrated a significant reduction in blood pressure. The intervention significantly lowered systolic blood pressure (SBP) by -7.75 mmHg (95% CI: -8.99 to -6.52 ; $p < 0.0001$; $I^2 = 11.8\%$) and diastolic blood pressure (DBP) by -4.99 mmHg (95% CI: -6.14 to -3.84 ; $p < 0.0001$; $I^2 = 31.9\%$) compared with control.

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Conclusion: Triple single-pill combination therapy significantly reduced systolic and diastolic blood pressure than dual therapy.

Keywords: *Triple single-pill combination, hypertension, dual single-pill combination, systolic blood pressure, diastolic blood pressure.*

PD-075

Beyond Blood Pressure Control: Mineralocorticoid Receptor Antagonists vs ACE-Inhibitors/ARBs in Hypertensive HFpEF and HFmrEF Population — A Systematic Review and Meta-Analysis of Randomized Controlled Trials

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Background: HFpEF and HFmrEF are heterogeneous syndromes in which hypertension plays central role in disease progression. ACE-I and ARBs are widely prescribed for blood pressure control, yet their effects on hard clinical outcomes remain inconsistent. MRAs target aldosterone-driven inflammation and myocardial fibrosis, offering benefits beyond blood pressure reduction.

Objective: This study aimed to compare efficacy and safety of MRAs versus ACE-I/ARBs in this population.

Methods: We conducted a systematic review and meta-analysis of randomized trials evaluating MRAs or ACE-I/ARBs in HFpEF and HFmrEF. Included trials were FINEARTS-HF, TOPCAT, ALDO-DHF, I-PRESERVE, CHARM-Preserved, and PEP-CHF. The primary outcome

was heart failure hospitalization (HFH). Secondary outcomes included cardiovascular mortality, NT-proBNP, left ventricular mass index (LVMI), diastolic function (E/e'), and hyperkalemia.

Results: A total of 17,869 patients were included. MRAs significantly reduced HF hospitalization (HR 0.82; 95% CI 0.74–0.92; $p=0.0006$), whereas ACE-I/ARBs demonstrated only a marginal effect (HR 0.90; 95% CI 0.81–1.00; $p=0.05$). Neither drug class significantly reduced cardiovascular mortality. MRAs produced greater reductions in NT-proBNP (SMD -0.31 vs. -0.03) and were associated with significant reverse cardiac remodeling, including reductions in LVMI (MD -6.10 g/m²) and improvement in E/e' ratio (MD -0.90). However, hyperkalemia occurred more frequently with MRAs (RR 2.14; 95% CI 1.87–2.45).

Conclusion: In hypertensive patients with HFpEF and HFmrEF, MRAs provide superior clinical and mechanistic benefits compared with ACE-I/ARBs, significantly reducing heart failure hospitalizations and promoting reverse myocardial remodeling. Despite increased risk of hyperkalemia, the overall benefit-risk profile supports reconsideration of MRAs as a preferred therapeutic strategy beyond conventional antihypertensive use in this population.

Keywords: HFpEF; HFmrEF; MRA; ACE-inhibitors; Hypertension

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PD-076

Efficacy of Combined Resistance and Aerobic Exercise as a Non-Pharmacological Intervention in Hypertensive Patients: A Systematic Review

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Background: Hypertension is a major contributor to cardiovascular disease, and exercise is a key non-pharmacological strategy for blood pressure control. While aerobic exercise is widely recommended, resistance and combined aerobic–resistance training may offer additional benefits for vascular function, autonomic regulation, inflammation, and metabolic health.

Objective: This systematic review aims to evaluate and compare the effects of aerobic, resistance, and combined aerobic–resistance training on peripheral and central blood pressure in hypertensive adults.

Methods: A systematic search of PubMed, Europe PMC, and Cochrane Library up to 16 January 2026 identified randomized and non-randomized controlled trials of aerobic, resistance, or combined exercise in hypertensive adults. Primary outcomes were peripheral and central blood pressure. Risk of bias was assessed using RoB 2 and ROBINS-I.

Result: Of 5,853 records, randomized controlled trials were included. Most used block randomization and stratification. Resistance and combined exercise consistently reduced systolic and diastolic blood pressure, including central and 24-hour ambulatory measures. Resistance training alone lowered systolic by ~8–10 mmHg and diastolic

by ~4–5 mmHg, with improved endothelial function and hemodynamics. Combined training enhanced ambulatory blood pressure and autonomic function. Evidence quality was low to moderate, with some variability in protocols and outcomes.

Conclusion: Aerobic, resistance, and combined aerobic–resistance exercise interventions effectively reduce blood pressure in hypertensive adults, improving peripheral and central blood pressure, vascular function, autonomic regulation, and body composition, supporting their use in hypertension management

Keywords: Hypertension; Aerobic Exercise; Resistance Training; Combined Exercise).

PD-077

Influence of Acute E-Cigarette Inhalational Exposure on Systemic Blood Pressure: A Systematic Review and Meta-Analysis of RCTs

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Abstract

Background: Electronic cigarettes have become increasingly prevalent, widely perceived as a safer alternative to traditional cigarettes. However, nicotine exposure from e-cigarettes (EC) has shown to acutely alter cardiovascular regulation by elevating systolic blood pressure (SBP) and diastolic blood pressure (DBP), indicating potential adverse effects on hypertension risk.

Objective(s): This study is conducted to evaluate the relationship between EC and blood pressure, specifically SBP and DBP and its association with hypertension.

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Methods: This study used PubMed, Scopus, and Cochrane databases. The initial search identified 70 articles, of which 7 RCTs remained after screening. Rayyan was used for study screening, duplicate removal, and data extraction. Final eligibility was assessed using Google Sheets to confirm data suitability for meta-analysis, resulting in 3 final RCTs.

Results: A meta-analysis of 3 RCTs (65 patients) confirmed acute EC exposure, especially SBP chance to get higher 1.7 times with nicotine e-cigarettes. It also was associated with elevated levels of both SBP and DBP, with low SBP heterogeneity ($I^2 = 23.8\%$) and high DBP heterogeneity ($I^2 = 76.7\%$). Overall, meta-analysis and systematic review findings indicate nicotine-containing EC acutely increase SBP and DBP, while non-nicotine controls show smaller, nonsignificant rises. High DBP heterogeneity reflects differences in blood measurement timing and vaping observations across journals.

Conclusion: Nicotine-containing ECs are consistently associated with acute SBP and DBP elevation, indicating a potential role of nicotine as a contributor to hypertension risk. We advise future researchers to conduct a gene pathway analysis to identify how SBP and DBP differ.

Keywords: Systemic Blood Pressure, Systolic Blood Pressure, Diastolic Blood Pressure, E-cigarette, Nicotine.

PD-078

Visit-to-Visit Blood Pressure Variability and Alzheimer's Disease-Related Biomarkers: A Systematic Review

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Background: Visit-to-visit blood pressure variability (BPV) is increasingly recognized as a vascular risk factor associated with Alzheimer's disease

(AD), independent of mean blood pressure. However, its association with AD-related biomarkers remains unclear.

Objective: This review aimed to investigate the association between visit-to-visit BPV and AD-related biomarkers.

Method: A systematic search following PRISMA guidelines was conducted in PubMed, EuroPMC, ProQuest, and Wiley up to January 5, 2025. Observational studies evaluating visit-to-visit BPV and AD-related biomarkers (tau, amyloid- β , and plasma neurofilament light (pNfL)) in non-demented populations were included. Studies were screened using predefined criteria; risk of bias was assessed using the Newcastle-Ottawa Scale.

Result: Seven observational studies were included, involving over 5,000 older adults. Higher visit-to-visit BPV was consistently associated with elevated tau-related biomarkers across plasma, cerebrospinal fluid, and positron emission tomography (PET) imaging. Neuroimaging studies further demonstrated greater tau accumulation in brain regions vulnerable to AD. Elevated BPV was also associated with neurodegenerative biomarkers, including increased pNfL. In contrast, associations with amyloid biomarkers were mostly null. Although one large imaging study reported greater amyloid burden and increased AD risk with higher BPV, most studies found no significant associations.

Conclusion: Visit-to-visit BPV shows stronger associations with tau-related pathology and neurodegeneration than with amyloid biomarkers. These findings suggest that blood pressure instability may contribute to AD neurodegenerative changes, potentially through tau-dominant pathways. However, methodological heterogeneity across studies should be considered. Future studies using standardized BPV metrics and biomarker assessment methods are needed to confirm these findings and further define the biological mechanisms linking BPV to AD pathology.

Keywords: blood pressure variability; alzheimer's disease; biomarker; tau; amyloid.

Comparative Efficacy of Thiazide Diuretics vs Enalapril for the Treatment of Isolated Systolic Hypertension: A Systematic Review of RCTs

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Background: Isolated Systolic Hypertension (ISH) remains a preeminent cardiovascular risk factor among the elderly, notwithstanding advancements in antihypertensive protocols. While Thiazide diuretics and Enalapril effectively reduce blood pressure and facilitate organ protection, scholarly consensus remains elusive regarding which pharmacological agent yields superior efficacy in the targeted reduction of systolic pressure.

Objective: This systematic review aimed to evaluate the Comparative Efficacy of Thiazide Diuretics vs Enalapril for the Treatment of Isolated Systolic Hypertension.

Methods: Studies were extracted from PubMed, ScienceDirect, and EuropePMC with keywords "Thiazide Diuretics," "Enalapril," and "Isolated Systolic Hypertension". Three independent researchers systematically analyzed the studies on December 5, 2025, reviewing efficacy, mean SBP change (baseline to ≥ 12 -week follow-up) and SBP target achievement ($< 140/130$ mmHg). The included studies were randomized controlled trials, while meta-analyses, systematic reviews, case reports, and animal studies were excluded. To assess quality, the Cochrane Risk of Bias (ROB II) criteria was applied.

Results: Seven studies met the RoB II criteria. Collectively, three studies demonstrated that while monotherapy achieves a baseline reduction in systolic blood pressure (SBP), the strategic use of these agents as add-on therapies is essential for reaching more stringent clinical targets

and reducing long-term cardiovascular complications, particularly stroke. Two studies reported that both agents produced comparable mean reductions in SBP from baseline. Another study corroborated these findings by confirming sustained SBP reductions, indicating equivalent antihypertensive efficacy and supporting the interchangeable use of these drug classes as first-line therapies for isolated systolic hypertension (ISH). However, one pivotal comparative study suggested a slight clinical advantage of thiazide diuretics over enalapril with respect to target achievement rates. Specifically, the data revealed a higher responder rate among patients receiving thiazide therapy

Conclusions: Thiazide diuretics and Enalapril demonstrate equivalent efficacy in reducing systolic blood pressure, yet Thiazide achieves a higher clinical response rate in elderly patients. Further studies are required to confirm these findings.

PD-080

A Systematic Review and Metaanalysis Studies of Association of Hypertension to silent Brain Infarction in Atrial Fibrillation

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ABSTRACT

Background: Atrial fibrillation (AF) and hypertension are well-established independent risk factors for clinical stroke and silent brain infarction (SBI). SBI, an imaging-defined cerebrovascular injury without overt neurological symptoms, is strongly associated with future stroke and cognitive decline. Although AF and hypertension each contribute to cerebrovascular pathology, the specific relationship between hypertension and SBI within the AF population remains unclear.

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Objective: To evaluate the existing evidence on the association between hypertension and SBI in patients with AF.

Methods: A systematic review and exploratory meta-analytic synthesis were conducted using predefined eligibility criteria. Studies were screened for AF populations, hypertension as an exposure, SBI or related cerebrovascular outcomes assessed by neuroimaging, and reported quantitative associations. Data extraction focused on study design, definitions, effect estimates, and confounder adjustment.

Results: No study directly assessed the association between hypertension and SBI specifically within an AF cohort. However, consistent indirect evidence was identified. Meta-analytic data show that AF is independently associated with a higher prevalence of SBI. Within AF cohorts, hypertension significantly increases the risk of symptomatic ischemic stroke and systemic embolism. Moreover, the association between AF and cognitive impairment persists after adjustment for hypertension, suggesting a potential mediating role of SBI.

Conclusion: Although direct evidence is lacking, converging epidemiological and mechanistic data suggest that hypertension amplifies the burden of silent cerebrovascular injury in patients with AF. Blood pressure optimization represents a critical and modifiable target, and prospective AF-specific studies with standardized neuroimaging are urgently needed.

Keywords: *Atrial Fibrillation; Hypertension; Silent Brain Infarction; Stroke; Cognitive Impairment.*

PD-081

Catheter Ablation Versus Antiarrhythmic Drugs for Premature Ventricular Contraction: A Systematic Review and Meta-Analysis**Yusuf Omar Setyoadji (1), Fahrin Sadinah (1), Muh Hakim Naufaldi(2),
Yoga Waranugraha (3)***(1) Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia**(2) Faculty of Medicine, Universitas Muhammadiyah Malang, Malang, Indonesia**(3) Cardiology Department, Faculty of Medicine, Universitas Brawijaya, Malang, Indonesia***ABSTRACT**

Background: Premature ventricular contraction (PVC) is the most common ventricular arrhythmia, and may lead to PVC-induced cardiomyopathy when it occurs frequently. Antiarrhythmic drugs (AADs) are often used as first-line therapy, but show limited efficacy and are accompanied by adverse effects. Catheter ablation has emerged as a potentially superior therapeutic strategy, but its comparative efficacy with AADs remains incompletely established.

Objective: This study aimed to compare the effectiveness of ablation versus AADs in managing PVC.

Methods and Results: Six studies (2 RCTs, 4 cohort studies) from 2007-2014 reporting on US, China, Russia, Poland, and Michigan involving 1149 patients were included. Four studies were eligible for meta-analysis. Compared with AAD therapy, ablation showed greater improvement in left ventricular ejection fraction (LVEF), PVC burden and rate, fractional shortening, left ventricular end-diastolic and end-systolic dimensions, and quality of life. Meta-analysis showed improvements in LVEF of 4.83% and PVC burden of 20.98%, although statistical significance was borderline ($p = 0.09$ and $p = 0.11$), with substantial heterogeneity ($I^2 > 90\%$).

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Conclusion: Catheter ablation provides more benefits in LVEF, PVC burden, cardiac structure, and symptoms. Although statistical significance was borderline, consistent effects suggest ablation may be a viable first-line option. High heterogeneity may reflect variation in PVC burden, patient selection, and follow-up. Further large-scale randomized trials are required to confirm these findings.

Keywords: *Ventricular premature complexes, anti-arrhythmia agents, catheter ablation, ventricular function, quality of life.*

PD-082

Differential Effects of Intensive Blood Pressure Control on White Matter Hyperintensity Progression Versus Lacunar Infraction : A Systematic Review and Meta-Analysis

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Background : Hypertension is a major determinant of cerebral small vessel disease, contributing to both white matter hyperintensity (WMH) progression and lacunar infarction. Although intensive blood pressure control has consistently been associated with WMH progression, its effects on lacunar infarction remain inconsistent, suggesting pathophysiological divergence. Whether intensive blood pressure lowering confers uniform cerebrovascular protection across these outcomes remains unclear.

Objective : To evaluate the differential effects of intensive blood pressure control on WMH progression versus lacunar infarction and to clarify its outcome-specific cerebrovascular benefits.

Method : A systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. PubMed, Scopus, ScienceDirect, Wiley, and EBSCO were searched from inception to the most recent

available date. Randomized controlled trials and observational studies comparing intensive versus standard blood pressure control and reporting WMH progression and/or lacunar infarction were included. Random-effects models were used to synthesize pooled effect estimates, with subgroup analyses by outcome type. Statistical heterogeneity was assessed using the I^2 statistic. Risk of bias was evaluated using Cochrane Risk of Bias 2.0 and the Newcastle–Ottawa Scale.

Result : Intensive blood pressure control was consistently associated with significant attenuation of WMH progression compared with standard control. In contrast, no consistent reduction in lacunar infarction incidence was observed. Heterogeneity ranged from moderate to substantial, reflecting variability in blood pressure targets and follow-up duration. Overall risk of bias was low to moderate.

Conclusion : Intensive blood pressure control preferentially mitigates chronic white matter injury rather than preventing lacunar infarction, supporting a differential cerebrovascular response to blood pressure lowering.

Keywords : *Intensive blood pressure control ; Hypertension ; White matter hyperintensity ; Lacunar infarction ; Cerebral small vessel disease.*

Nighttime Blood Pressure Non-Dipping and Silent Brain Injury: A Systematic Review and Meta-Analysis of Mechanistic Pathways Linking Circadian Disruption, Blood-Brain Barrier, and Cognitive Decline

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Background : Nocturnal blood pressure non-dipping is a common circadian abnormality in treated hypertension and is associated with silent cerebrovascular injury and early cognitive decline. However, the mechanistic link between circadian blood pressure disruption and brain injury remains incompletely understood. Blood-brain barrier (BBB) dysfunction has been proposed as a potential mediator, yet no systematic synthesis has integrated clinical, imaging, and mechanistic evidence.

Objective: To synthesize evidence linking nocturnal blood pressure non-dipping to silent cerebrovascular injury and cognitive impairment, focusing on BBB dysfunction.

Method: This systematic review and meta-analysis followed PRISMA 2020 guidelines. PubMed, Scopus, ScienceDirect, Wiley, and EBSCOhost were searched from inception to December 2025. Risk of bias was assessed using the Newcastle-Ottawa Scale and certainty of evidence with GRADE. Random-effects meta-analyses were performed, reporting pooled effect estimates, with heterogeneity assessed using the I^2 statistic. Publication bias was evaluated by funnel plot inspection.

Result: Screening identified 25 eligible studies comprising 12,847 participants. Non-dipping was associated with higher odds of white matter hyperintensities (OR 1.94 [95% CI 1.48–2.57], $I^2=36%$) and a trend toward increased silent lacunes (OR 1.38 [0.95–2.02]). BBB permeability was elevated among non-dippers (albumin ratio SMD 0.67

[0.42–0.92]). Silent cerebrovascular lesions mediated approximately 28% (19–37%) of the association between non-dipping and cognitive decline, with non-dippers showing greater MoCA score reduction (–1.5 points, $p < 0.01$).

Conclusion: Nocturnal blood pressure non-dipping is associated with silent cerebrovascular injury and cognitive decline, with BBB dysfunction emerging as a key mechanistic mediator.

Keyword: *Nocturnal hypertension; Non-dipping pattern; Cerebral small vessel disease; Blood–brain barrier permeability; Vascular cognitive impairment.*

PD-084

Visit-to-Visit Blood Pressure Variability Versus Mean Blood Pressure in Predicting Progression of White Matter Hyperintensities and Silent Cerebral Infraction : A Systematic Review and Meta-Analysis

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Background: White matter hyperintensities (WMH) and silent cerebral infarction (SCI) represent key manifestations of cerebral small vessel disease. Although hypertension is a major contributor, mean blood pressure (MBP) alone may inadequately reflect cumulative microvascular hemodynamic stress. Visit-to-visit blood pressure variability (BPV) has emerged as a potential independent determinant of cerebrovascular injury. However, its incremental prognostic value beyond MBP for WMH progression and SCI has not been systematically quantified.

Objective: To evaluate the associations of visit-to-visit BPV and MBP with WMH progression and SCI, and to determine whether BPV provides

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prognostic information beyond MBP for longitudinal cerebrovascular injury.

Method: This systematic review and meta-analysis followed PRISMA 2020 guidelines. Searches were conducted in PubMed, Scopus, ScienceDirect, Wiley, and EBSCOhost for longitudinal observational studies. Risk of bias was assessed using the Newcastle–Ottawa Scale and certainty of evidence with GRADE. Random-effects meta-analyses were performed, reporting pooled effect estimates with 95% confidence intervals. Statistical heterogeneity and publication bias were evaluated using the I^2 statistic.

Result: 13 studies ($n \approx 10,000$) were included. Visit-to-visit BPV independently predicted WMH progression ($\beta = 0.013\text{--}0.030$ mL/year, $p < 0.05$), demonstrating a stronger association than mean blood pressure. In contrast, elevated systolic BPV was associated with an increased risk of lacunar infarction, with an approximately threefold higher odds reported across five studies. Moderate heterogeneity was observed ($I^2 = 35\text{--}50\%$) due to BPV metric differences. Study quality was moderate to high (Newcastle–Ottawa Scale 6–8/9), with overall evidence certainty rated as moderate.

Conclusion: Visit-to-visit BPV exhibits stronger associations with WMH progression than mean blood pressure, while its relationship with lacunar infarction appears less consistent, suggesting differential susceptibility of chronic versus focal small vessel injury to blood pressure dynamics. These findings support outcome-specific blood pressure risk stratification in cerebral small vessel disease.

Keywords: *visit-to-visit blood pressure variability ; blood pressure variability ; mean blood pressure ; hypertension*

PD-085

Magnitude and Variability of Blood Pressure Reduction with Dietary Sodium Restriction in Adults Aged ≥ 40 Years: A Systematic Review of Randomized Controlled Trials

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ABSTRACT

Background: Excess dietary sodium intake is a leading modifiable risk factor for elevated blood pressure. High sodium intake increases BP through intravascular volume expansion, endothelial dysfunction, increased sympathetic activity, and arterial stiffening. Adults aged ≥ 40 years exhibit greater salt sensitivity and higher cardiovascular risk, with heterogeneous BP responses to sodium reduction. Characterizing the magnitude of BP reduction with dietary sodium restriction is clinically relevant.

Objective: To evaluate the magnitude and variability of blood pressure reduction with dietary sodium restriction in adults aged ≥ 40 years.

Methods: A systematic review was conducted in accordance with PRISMA guidelines. PubMed, ScienceDirect, Wiley, and ProQuest were searched for RCTs published between 2020 and 2025 evaluating dietary sodium restriction in adults aged ≥ 40 years. Dietary sodium restriction was defined as interventions aimed at reducing sodium intake, including low-sodium salt substitution or direct dietary salt reduction. Eligible studies reported changes in systolic and/or diastolic blood pressure compared with control groups.

Results: Five RCTs were included, evaluating the effects of dietary sodium restriction on blood pressure in adults aged ≥ 40 years, with intervention durations ranging from 2 - 24 months. Baseline systolic

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blood pressure ranged from 128.4 ± 13.04 mmHg, while baseline diastolic blood pressure ranged from 79.4 ± 8.93 mmHg. Across studies, dietary sodium restriction was associated with greater reductions in blood pressure compared to control groups. SBP reductions reached up to 11.09 ± 3.21 mmHg, while DBP reductions reached up to 9.6 ± 3.6 mmHg. Sodium restriction within studies ranged from 37.5 to 60% of daily sodium intake, with reported salt intake ranging from 2 to 3.125 g/day.

Conclusion: Dietary sodium restriction is associated with meaningful reductions in both systolic and diastolic blood pressure among adults aged ≥ 40 years, despite variability in intervention strategies, supporting its role as a feasible non-pharmacological strategy for hypertension management.

Keywords: dietary sodium restriction; blood pressure; adults aged ≥ 40 years; randomized controlled trials.

PD-086

Beyond the Cuff: Unmasking, Predicting, and Screening True Resistant Hypertension Through Novel Circulating Biomarkers — A Meta-Analysis of Diagnostic Test Accuracy

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ABSTRACT

Background: Accurate diagnosis and early prediction of true resistant hypertension (RHTN) are critical to avoiding reactive diagnostic pathways and prolonged, ineffective treatment cycles. Such delays, often compounded by white-coat effects, increase cardiovascular vulnerability. Novel circulating biomarkers offer a proactive approach to early "unmasking", potentially bypassing lengthy treatment algorithms to enable timely, precision-based interventions.

Objective: This study evaluates the diagnostic performance of novel biomarkers in identifying and screening for true RHTN.

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Methods: A systematic review and diagnostic meta-analysis following PRISMA-DTA guidelines was conducted and registered in PROSPERO (CRD420261289209). Five databases, including PubMed, ScienceDirect, Proquest, Epistemonikos, and Scopus, were searched using the PIROS framework. Statistical analysis was performed using RStudio (v.4.4.3) with the mada package. Methodological quality was appraised using the QUADAS-2 tool.

Result: Seven articles met the inclusion criteria. Overall, biomarkers demonstrated high diagnostic utility with a pooled sensitivity of 88% (95%CI: 82%–91%), specificity of 88% (95%CI: 81%–93%), and a robust Diagnostic Odds Ratio of 48.75 (95%CI: 22.66–104.86). Among traditional biomarkers, the Monocyte-HDL ratio showed balanced performance (Sensitivity: 87%, Specificity: 88%), while ENOA and PGBM exhibited superior accuracy (Sensitivity: 95%, Specificity: 98%). The SROC plot confirmed excellent global diagnostic power. However, a wide predictive region suggest that individual biomarker performance varies across different populations. QUADAS-2 analysis indicated "some concerns" in the majority of included studies.

Conclusion: Novel circulating biomarkers, specifically ENOA, PGBM, and Monocyte-HDL ratio, demonstrate excellent diagnostic potential for screening resistant hypertension, thereby improving early detection and risk stratification.

Keywords: *Biomarker, Resistant hypertension, Sensitivity, Specificity*

Attachment: Results

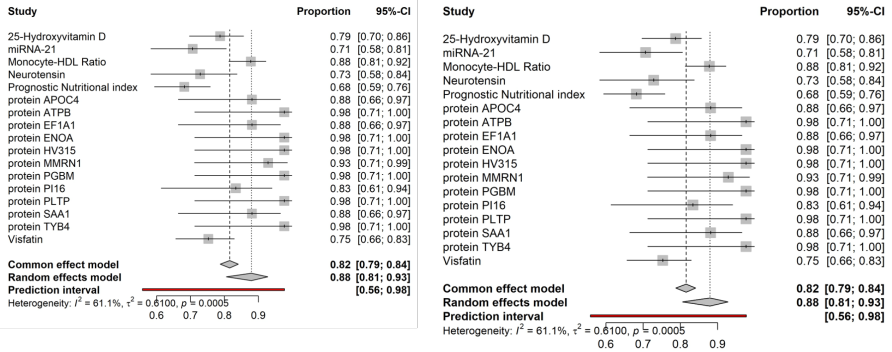


Figure 1. Forest Plot of Sensitivity and Specificity

Hierarchical SROC (HSROC) - 17 Biomarkers

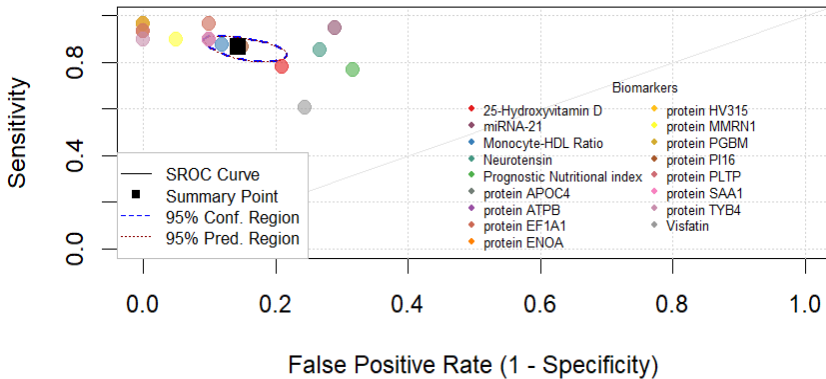


Figure 2. SROC Each Biomarker

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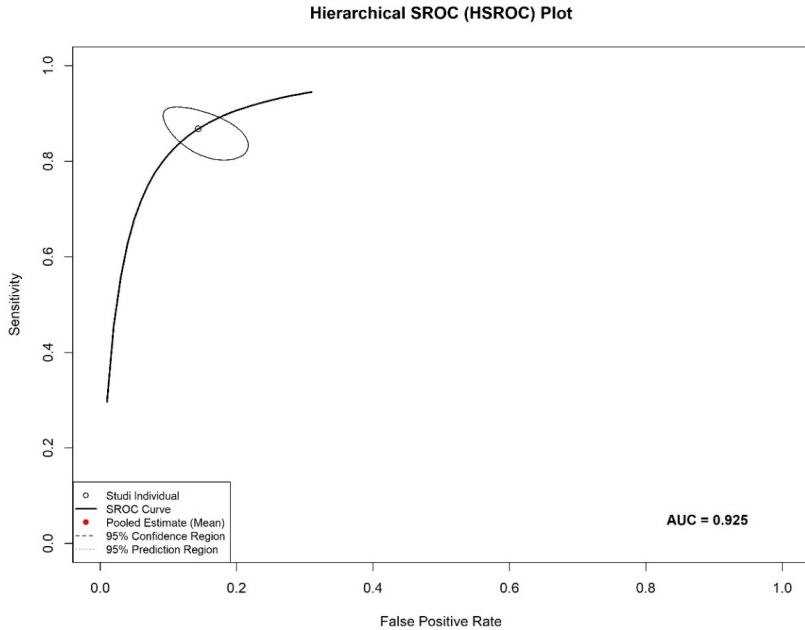


Figure 3. Overall HSROC and Area Under Curve (AUC)

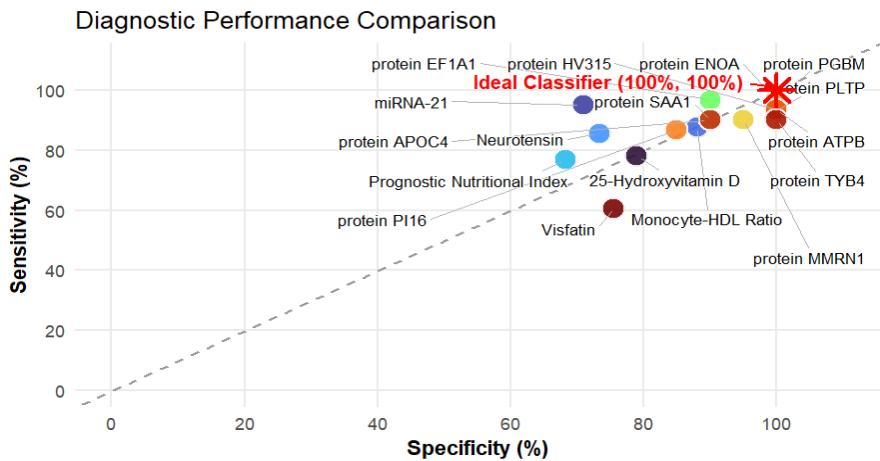


Figure 4. ROC Space Plot of Sensitivity and Specificity

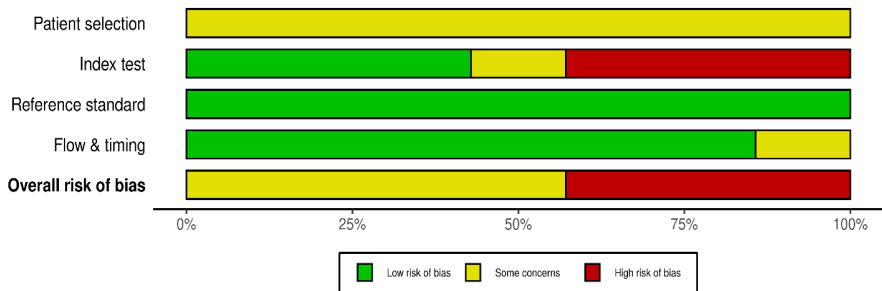
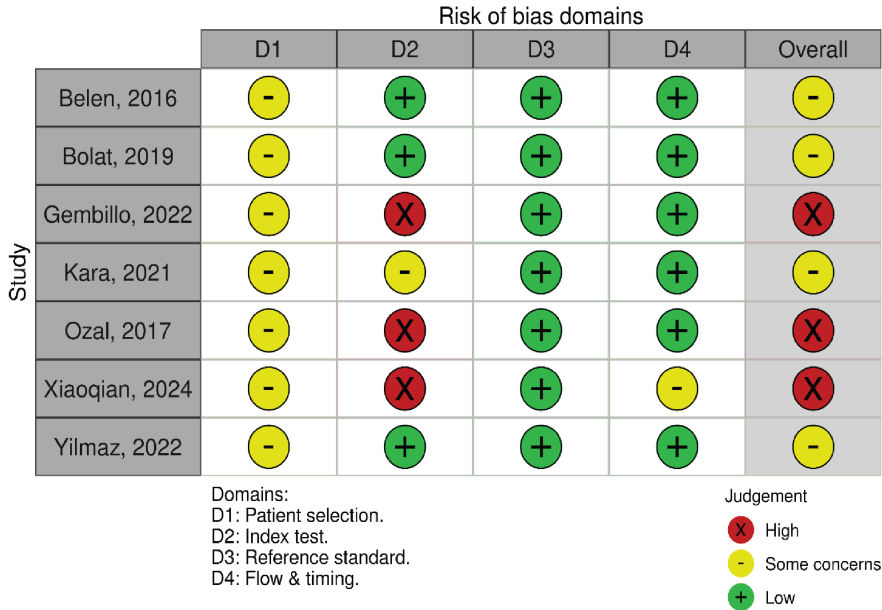


Figure 5. Trafficts Light and Summary Plot of QUADAS-2

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Sensitivity	0.88 (95% CI: 0.82 to 0.92)
Specificity	0.88 (95% CI: 0.81 to 0.93)

Prevalences	37.1%		
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Outcome	Nr of studies (Nr of patients)	Study design	Factors that may decrease certainty of evidence					Effect per 1,000 patients tested	Test accuracy CoE
			Risk of bias	Indirectness	Inconsistency	Imprecision	Publication bias		
True positives (patients with Resistant Hypertension)	7 studies 344 patients	cohort & case-control type studies	serious	not serious	serious	serious	publication bias strongly suspected strong association all plausible residual confounding would reduce the demonstrated effect	pre-test probability of 37.1%	⊕⊕○○ Low
326 (304 to 341)									
False negatives (patients incorrectly classified as not having Resistant Hypertension)								45 (30 to 67)	
True negatives (patients without Resistant Hypertension)	7 studies 583 patients	cohort & case-control type studies	serious	not serious	serious	serious	publication bias strongly suspected strong association all plausible residual confounding would reduce the demonstrated effect	554 (509 to 585)	⊕⊕○○ Low
False positives (patients incorrectly classified as having Resistant Hypertension)								75 (44 to 120)	

Figure 6. GRADE Assessment

PD-087

Comparative Efficacy of Antihypertensive Drug Classes in VEGF Inhibitor-Induced Hypertension: A Pairwise Meta-analysis

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Vascular endothelial growth factor inhibitors (VEGFIs) are widely used in the treatment of solid malignancies but frequently induce hypertension, affecting up to 80% of patients. This condition represents a mechanism-based toxicity that increases cardiovascular risk and may lead to interruption of cancer therapy. Furthermore, optimal antihypertensive management for VEGFI-induced hypertension remains unclear, as available evidence is limited and heterogeneous, with no class-based comparisons focused on blood pressure control.

This study aimed to evaluate the efficacy of different antihypertensive drug classes in achieving blood pressure control in patients with VEGFI-induced hypertension.

A systematic review and pairwise meta-analysis were conducted. Eligible studies included adult patients receiving VEGF inhibitors who were treated with antihypertensive agents and reported relevant clinical outcomes. Random-effects models were applied to pool risk ratios for blood pressure control and hazard ratios for survival outcomes, stratified by antihypertensive drug class.

Fourteen studies comprising 8,504 patients and 32 treatment arms were included. Outcomes varied by antihypertensive drug class. Calcium channel blockers (CCBs) showed the most consistent benefits, with improved blood pressure control and significant associations with both overall survival (OS) and progression-free survival (PFS). Other antihypertensive classes, including renin-angiotensin-aldosterone system inhibitors and beta blockers, showed variable efficacy, while diuretic use was not consistently beneficial. Between-study heterogeneity ranged from low to moderate.

Blood pressure control in VEGFI-induced hypertension is influenced by antihypertensive drug class. CCBs appear to offer the most consistent efficacy, supporting their use as first-line therapy and emphasizing the need for mechanism-based antihypertensive selection in VEGFI-treated patients.

Keyword: VEGF inhibitor-induced hypertension; Hypertension; VEGF inhibitor; Antihypertensive agent

Poster

PD-088

Comparative Efficacy of Pharmacological Treatments for Hypertension Disorders Pregnancy: An Updated Network Meta-Analysis

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Background: Hypertensive disorders in pregnancy can complicate 10% of gestations, posing severe risks including stroke, HELLP syndrome, and maternal death. While pharmacotherapy using labetalol, nifedipine, or methyldopa is essential to delay delivery and reduce neonatal morbidity, international guidelines lack consensus on a preferred agent due to insufficient head-to-head evidence.

Objective: This network meta-analysis synthesizes existing data to establish a definitive therapeutic hierarchy, optimizing clinical outcomes through evidence-based pharmacological selection.

Methods: Various databases were utilised and keywords were searched based on the PICO framework. RoB2 were used for risk of bias, followed by network meta-analysis analysis using R Studio. Data was collated using netplot, forest plots, comparative tables and egger test for data visualisation.

Results: Our study includes 20 trials, involving 2981 patients. Compared to placebo or no treatment, labetalol and methyldopa significantly reduced the risk of severe hypertension (RR 0.18; (95% [CI 0.05 - 0.33]) and (RR 0.39; (95% [CI 0.17 - 0.87])). Notably, our network meta-analysis revealed that labetalol was superior to nifedipine in reducing the incidence of pre-eclampsia (RR 0.44; (95% [CI 0.21 - 0.76])) and pre-term birth (RR 0.59; 95% [CI 0.21 - 0.76])). No other statistically

significant differences were detected across the remaining maternal or neonatal outcomes evaluated.

Conclusion: This network meta-analysis found no differences in severe hypertension recurrence or birthweight between agents. However, labetalol showed modest advantages over nifedipine in reducing pre-eclampsia and preterm birth. Future research using real-world data is essential to refine pharmacological and improve maternal-neonatal outcomes.

Keywords: Hypertension Disorders Pregnancy; Pharmacological Treatments; Network Meta-analysis;

PD-089

Association Between SGLT2 Inhibitor Therapy and Atrial Fibrillation Outcomes: A Contemporary Cardiovascular Perspective

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Background: Atrial fibrillation (AF) frequently coexists with heart failure (HF) and type 2 diabetes mellitus (T2DM), conferring substantial excess risk of hospitalization, stroke, and mortality. While sodium-glucose cotransporter-2 inhibitors (SGLT2i) have emerged as cornerstone therapy for HF and cardiorenal protection, their association with AF-related outcomes remains incompletely defined across different clinical phenotypes. Contemporary randomized trials and mechanistic insights suggest potential anti-arrhythmic effects mediated through modulation of atrial remodeling, inflammation, and hemodynamic loading.

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Objective: To comprehensively evaluate the association between SGLT2 inhibitor therapy and atrial fibrillation outcomes, including incident AF, AF recurrence, and cardiovascular outcomes stratified by baseline AF status.

Methods: We performed a contemporary evidence synthesis of randomized controlled trials, predefined secondary analyses, prospective studies, and meta-analyses evaluating SGLT2 inhibitors and AF outcomes. Seven pivotal studies were analyzed, encompassing large cardiovascular outcome trials (EMPA-REG OUTCOME, DECLARE-TIMI 58), HF trials across the ejection-fraction spectrum (DAPA-HF, EMPEROR-Reduced, EMPEROR-Preserved), a prospective catheter ablation study, and pooled meta-analyses. Outcomes of interest included incident AF or atrial flutter, AF recurrence after ablation, HF hospitalization, cardiovascular death, and renal endpoints.

Results: Across heterogeneous populations, SGLT2 inhibitors consistently reduced HF and renal events irrespective of baseline AF. Dapagliflozin significantly reduced first and total AF/atrial flutter events in patients with T2DM, while empagliflozin demonstrated numerically lower incident AF in HFrEF and consistent benefit in HFpEF regardless of AF status. Canagliflozin showed a neutral overall effect on AF incidence but reduced AF-related complications and suggested benefit in patients without prior AF. In patients undergoing catheter ablation, SGLT2 inhibitor therapy was associated with significantly lower AF recurrence compared with non-SGLT2 glucose-lowering strategies.

Conclusion: SGLT2 inhibitor therapy is associated with favorable atrial fibrillation-related outcomes, including reduced AF burden, lower recurrence after ablation, and robust cardiovascular benefits independent of baseline AF. These findings support a paradigm in which SGLT2 inhibitors act not only as metabolic and heart-failure therapies but also as modulators of atrial disease within contemporary cardiovascular practice.

Keywords: Arrhythmia, Atrial Fibrillation, Glycemic Control, Heart Failure, SGLT2i

References

1. Böhm M, Butler J, Abdin A, Filippatos G, Ferreira JP, Pocock SJ, et al. Heart failure outcomes and empagliflozin effects in patients with heart failure and reduced ejection fraction in sinus rhythm or atrial fibrillation: data from the EMPEROR-Reduced trial. *Eur J Heart Fail.* 2025;27:2218–28.
2. Böhm M, Slawik J, Brueckmann M, Mattheus M, George JT, Ofstad AP, et al. Efficacy of empagliflozin on heart failure and renal outcomes in patients with atrial fibrillation: data from the EMPA-REG OUTCOME trial. *Eur J Heart Fail.* 2020;22(1):126–35.
3. Butt JH, Docherty KF, Jhund PS, de Boer RA, Böhm M, Desai AS, et al. Dapagliflozin and atrial fibrillation in heart failure with reduced ejection fraction: insights from DAPA-HF. *Eur J Heart Fail.* 2022;24(3):513–25.
4. Filippatos G, Farmakis D, Butler J, Zannad F, Ferreira JP, Ofstad AP, et al. Empagliflozin in heart failure with preserved ejection fraction with and without atrial fibrillation. *Eur J Heart Fail.* 2023;25(7):970–7.
5. Kishima H, Mine T, Fukuhara E, Kitagaki R, Asakura M, Ishihara M. Efficacy of sodium-glucose cotransporter 2 inhibitors on outcomes after catheter ablation for atrial fibrillation. *JACC Clin Electrophysiol.* 2022;8(11):1393–404.
6. Li C, Yu J, Hockham C, Perkovic V, Neuen BL, Badve SV, et al. Canagliflozin and atrial fibrillation in type 2 diabetes mellitus: a secondary analysis from the CANVAS Program and CREDENCE trial and meta-analysis. *Diabetes Obes Metab.* 2022;24(10):1927–38.
7. Zelniker TA, Bonaca MP, Furtado RHM, Mosenson O, Kuder JF, Murphy SA, et al. Effect of dapagliflozin on atrial fibrillation in patients with type 2 diabetes mellitus: insights from the DECLARE-TIMI 58 trial. *Circulation.* 2020;141(15):1227–34.

SURVIVAL ANALYSIS OF RESISTANT HYPERTENSION AND FACTORS AFFECTING IT: A SYSTEMATIC REVIEW AND SURVIVAL-REGRESSION META-ANALYSIS

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ABSTRACT

Background: Resistant Hypertension (RHTN) is linked to a heightened risk of cardiovascular events; yet, the precise survival burden and the influence of various clinical factors on mortality have shown inconsistency across existing studies.

Objective: This study is designed to accurately quantify the overall survival risk and pinpoint the crucial determinants that impact the prognosis of patients diagnosed with RHTN.

Methods: Meta-analysis of survival performed with R Studio. Data were pooled using a random-effects model to estimate the Hazard Ratio (HR). Meta-regression was performed to explore causes of variability such as: age, sex, and comorbidities (diabetes, dyslipidemia, CVD, obesity,

renal failure, and smoking) on the Log Hazard Ratio.

Results: Total of 25 datasets with 135.955 RHTN patients included. Analysis of the cohorts revealed a pooled HR 1.33 (95%CI: 1.21 - 1.47) with higher rate in cardiovascular death (HR 1.42, 1.20 - 1.69). Survival-regression demonstrated a significant decline with increasing age and a higher proportion of male patients. Furthermore, higher prevalence of diabetes mellitus, history of CVD, and renal impairment were identified as potent predictors of reduced survival. Conversely, obesity showed a less pronounced negative impact on survival in this specific cohort, potentially reflecting a "hypertension-obesity paradox" in long-term mortality.

Conclusion: RHTN have a higher rate of mortality than control. Key mortality determinants include advanced age, male sex, diabetes, and pre-existing cardiovascular or renal disease. Aggressive, multi-factorial risk management, beyond just blood pressure control, is essential to improve long-term outcomes in this population.

Keywords: Dyslipidemia, Mortality, Resistant Hypertension, Survival.

PD-091

Urate-Lowering Therapy Reduces Blood Pressure: A Meta-Analysis of Randomized Trials

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Abstract

Background: Hyperuricemia is closely associated with hypertension, yet the blood pressure-lowering efficacy of pharmacological urate-lowering therapy (ULT) remains controversial.

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Objective: To evaluate the effect of urate-lowering therapy on systolic and diastolic blood pressure in adults with hyperuricemia and hypertension through a systematic review and meta-analysis of randomized controlled trials (RCTs).

Method: We systematically reviewed RCTs assessing urate-lowering agents (allopurinol, febuxostat, topiroxostat). Risk of bias was evaluated using the Cochrane RoB 2 tool. A random-effects meta-analysis was performed where feasible. Primary outcomes were mean differences (MD) in systolic (SBP) and diastolic blood pressure (DBP). Heterogeneity was assessed using the I^2 statistic.

Result: Five RCTs were included in qualitative synthesis, with risk of bias ranging from low ($n=2$) to high ($n=2$). Three RCTs ($n=318$) were eligible for meta-analysis, including two low-risk and one high-risk study. ULT showed a non-significant reduction in SBP (MD -1.93 mmHg; 95% CI -4.37 to 0.50 ; $p=0.12$) but a significant reduction in DBP (MD -2.35 mmHg; 95% CI -4.44 to -0.27 ; $p=0.03$). Both analyses demonstrated minimal heterogeneity.

Conclusion: Urate-lowering therapy significantly reduces diastolic blood pressure, supported by evidence from low-risk trials. Although no significant effect on systolic pressure was observed, these findings suggest a potential adjunctive role for ULT in blood pressure management. Larger, high-quality trials are needed to confirm clinical significance.

Keywords: Hyperuricemia, Hypertension, Urate-lowering therapy, Meta-analysis, Blood pressure.

PD-092

Hypertension Among School-Aged Children in Indonesia: A Systematic Review and Meta-Analysis of Prevalence, Trends, and Projections from 2011 to 2050

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Background: Childhood hypertension is increasingly recognized as an important early-life cardiovascular risk factor, as elevated blood pressure during childhood often persists into adolescence and adulthood.

Objective: To systematically quantify the prevalence, characterize temporal trends, and project the future prevalence burden of hypertension among Indonesian school-aged children.

Methods: A systematic review and meta-analysis were conducted in accordance with the MOOSE guidelines and PRISMA 2020. Literature searches were performed across Scopus, PubMed, and Google Scholar. Hypertension prevalence was synthesized in R using GLMM and random-effects models, while future prevalence was projected in Python using ARIMA. ROB was evaluated by Hoy tool.

Results: A total of 36 studies encompassing 12,125 school-aged children were included. The overall pooled prevalence of hypertension was 14.73% (95% CI: 10.74–19.88%), with a clear upward trend from 9.96% in 2011–2015 to 18.99% in 2021–2025. The highest prevalence was observed among primary school children (17.92%), followed by high school (14.10%) and middle school students (11.04%). Prevalence was higher in urban and metropolitan areas and varied geographically, with elevated estimates in Sumatra (18.39%) and Java (15.95%). Male children showed a higher prevalence than females. Elevated blood pressure was present in 17.90%, while grade 1 and grade 2 hypertension

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accounted for 12.31% and 2.27%, respectively. The pooled mean systolic and diastolic blood pressure were 112.67 mmHg and 71.74 mmHg. No significant publication bias was detected ($p = 0.9175$), and most studies demonstrated low risk of bias. Projections indicate that prevalence will rise to 26.28% by 2050, corresponding to over 16 million affected children, despite a declining pediatric population.

Conclusion: Indonesia is facing a rapidly escalating burden of hypertension among school-aged children. These findings underscore the urgent need for early screening, school-based prevention strategies, and targeted public health interventions, particularly in urban settings.

Keywords: Childhood hypertension, Prevalence burden, Temporal trends, Projection, Indonesia.

PD-093

Is Early Dual Single-Pill Combination Therapy Superior to Monotherapy in Asian Adults with Essential Hypertension? A Systematic Review and Meta-analysis

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Background: Evidence directly comparing early dual single-pill combination (SPC) antihypertensive therapy with optimized monotherapy in Asian populations remains limited. This systematic review and meta-analysis evaluated the short-term efficacy and tolerability of dual SPC therapy in Asian adults with essential hypertension.

Methods: In accordance with PRISMA 2020 guidelines, randomized controlled trials enrolling Asian adults (≥ 18 years) with essential hypertension were identified through PubMed, ScienceDirect,

OpenAlex, and ProQuest. From 356 records screened, seven trials met the inclusion criteria, of which four contributed to the meta-analysis. Eligible studies compared dual single-pill combination (SPC) therapy (calcium channel blocker plus angiotensin receptor blocker or angiotensin receptor blocker plus thiazide/thiazide-like diuretic) with corresponding monotherapy at equivalent or higher doses over 8–12 weeks. Primary outcomes were changes in systolic and diastolic blood pressure. Risk of bias was assessed using RoB 2, and random-effects meta-analyses were performed when appropriate.

Results: All included randomized controlled trials were assessed as having low risk of bias. Dual SPC therapy achieved significantly greater systolic BP reduction compared with monotherapy (mean difference -6.77 mmHg, 95% CI -9.22 to -4.31 ; $I^2 = 68\%$). A modest but statistically significant reduction in diastolic BP was also observed (-3.47 mmHg, 95% CI -6.41 to -0.53 ; $I^2 = 83\%$). BP control rates were generally higher with SPC therapy, with comparable safety and treatment discontinuation rates.

Conclusions: In Asian adults with essential hypertension, early dual SPC therapy provides superior short-term blood pressure reduction compared with optimized monotherapy without compromising tolerability.

Keywords: Single-pill combination; Essential hypertension; Antihypertensive therapy; Asian population

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Renal Sympathetic Denervation in Resistant Hypertension: A Systematic Review and Meta-Analysis of Blood Pressure Outcomes

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Background: Resistant hypertension is characterized by persistent sympathetic overactivity driving elevated blood pressure, impaired nocturnal dipping, and increased variability. Catheter-based renal sympathetic denervation (RDN) interrupts this neurogenic component. Early trials showed inconsistent results, while newer devices and techniques offer promising blood pressure reductions.

Objective: To quantify long-term RDN efficacy on ambulatory, office, morning, and nighttime blood pressure in resistant hypertension through a systematic review and meta-analysis.

Methods: PubMed, Cochrane, Embase searched to January 2026 using “renal denervation”, “resistant hypertension”, “ambulatory blood pressure”, “nighttime blood pressure”, “circadian”. Included prospective cohorts, sham-controlled trials, long-term extensions of catheter-based RDN reporting BP changes. Prior meta-analyses excluded. Quality via ROBINS-I. Random-effects meta-analysis (Review Manager 5.4) for Primary: 24-h ambulatory Systolic Blood Pressure (SBP) change. Secondaries: office, nighttime, morning SBP.

Findings: Seven studies (4 RCTs, 2 cohorts, 1 pooled analysis; N=1,413 adults, mean age ~58 years) were included, mostly low ROBINS-I bias (moderate in observational for confounding/missing data). Early trials were neutral; later-generation (refined ablation, branch treatment) showed sustained reductions. Meta-analysis (long-term 24-hour ambulatory SBP: Bhatt 2022, Sesa-Ashton 2023, Kario 2025, Kario

2022) yielded -14.3 mmHg (95% CI -16.3 to -12.3 ; $I^2=35\%$) favoring RDN. Office SBP: -19.7 mmHg (95% CI -33.1 to -6.3 ; $I^2=95\%$). Nighttime SBP: -13.6 mmHg (95% CI -17.8 to -9.4 ; $I^2=63\%$). Morning SBP: -18.5 mmHg (95% CI -27.2 to -9.7 ; $I^2=78\%$) at 24–36 months. Safety was favorable with low adverse events.

Interpretation: RDN achieves durable 13–20 mmHg SBP reductions over 2–9 years with contemporary techniques, supporting its role as adjunctive therapy in resistant hypertension via sympathetic modulation.

Keywords: Renal sympathetic denervation; Resistant hypertension; Systolic blood pressure; Ambulatory blood pressure monitoring; Nighttime blood pressure; Morning blood pressure; Systematic review; Meta-analysis; Sympathetic overactivity; Catheter-based therapy.

PD-095

MRI Versus CT for Knee Injuries: Diagnostic Accuracy and Implications for Perioperative Hemodynamic Stability and Blood Pressure Variability

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Background: Perioperative hypertension and blood pressure variability are closely linked to surgical stress, operative duration, and postoperative pain. Inaccurate preoperative diagnosis of knee pathology may prolong surgery, increase tissue manipulation, and exacerbate pain-related sympathetic activation, thereby contributing to perioperative hemodynamic instability. Magnetic resonance imaging (MRI) and computed tomography (CT), including dual-energy CT, are commonly used to evaluate knee injuries; however, their diagnostic accuracy varies by modality and lesion type, with potential downstream implications for perioperative stress and cardiovascular risk.

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Objective: To evaluate the diagnostic accuracy of MRI and CT-based imaging modalities for knee injuries using surgical reference standards and to assess their relevance to perioperative stress and hemodynamic stability.

Method: A systematic review and diagnostic accuracy synthesis was conducted. Studies reporting complete 2×2 contingency data (true positives, false positives, false negatives, and true negatives) with arthroscopy or surgical findings as the reference standard were included. Study-level sensitivity and specificity were calculated, and descriptive pooled estimates were derived. Given heterogeneity in imaging modalities and target lesions, results were interpreted using stratified and narrative synthesis rather than assuming a single homogeneous diagnostic effect.

Result: Six diagnostic datasets were included. Across all imaging modalities, pooled sensitivity was 91%, and pooled specificity was 83%, indicating high overall diagnostic performance. MRI-based studies demonstrated consistently high sensitivity for soft-tissue pathology, including meniscal and cartilage injuries, while specificity varied by lesion location. CT-based and dual-energy CT techniques showed high specificity but more variable sensitivity, particularly for ligamentous injuries. These modality and lesion-specific differences are clinically relevant, as improved diagnostic accuracy may reduce intraoperative uncertainty, operative time, and postoperative pain burden are key contributors to sympathetic activation and perioperative blood pressure variability.

Conclusion: MRI and CT demonstrate high diagnostic accuracy for knee injuries. By improving surgical planning and reducing perioperative stressors, accurate preoperative imaging may help mitigate sympathetic activation and perioperative blood pressure.

Keywords: Diagnostic Imaging; Knee Injuries; Magnetic Resonance Imaging; Tomography, X-Ray Computed

PD-096

Does When You Treat Matter? Cardiovascular Outcomes of Bedtime Compared With Morning Antihypertensive Administration

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Background: Hypertension is a major contributor to cardiovascular morbidity and mortality. Circadian variation in blood pressure has led to interest in whether the timing of antihypertensive administration. Recent evidence suggests that evening administration of antihypertensive therapy may confer greater cardiovascular risk reduction compared with morning dosing.

Objective: This systematic review and network meta-analysis aimed to compare morning and bedtime dosing of antihypertensives on cardiovascular events.

Method: Systematic search was conducted in accordance with PRISMA guidelines. Randomized Controlled Trials (RCT) published up to December 2025 involving adult patients with hypertension and comparing morning and bedtime dosing of antihypertensives on cardiovascular events. The primary endpoint was major adverse cardiovascular events (MACE), as defined in the individual studies. Secondary endpoints included all-cause mortality, stroke, myocardial infarction, and heart failure. Data were analyzed using Review Manager 5.3 and RStudio.

Result: Seven RCTs involving 65.359 participants were included. Median follow-up durations ranged from 1.1 to 6.3 years, and median participant

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ages ranged from 55.6 to 80 years. No significant differences were observed between the two groups in the incidence of major adverse cardiovascular events (MACEs) HR = 0.84 (95% CI: 0.65 to 1.11). There were no significant between-group differences in all-cause mortality HR = 0.82 (95% CI 0.62–1.09), stroke neither hemorrhagic nor ischemia HR = 0.78 (95% CI 0.55–1.11), myocardial infarction HR = 0.87 (95% CI 0.72–1.04), and heart failure HR = 0.71 (95% CI 0.50–1.06).

Conclusion: There was no significant timing difference in cardiovascular outcomes between morning and bedtime administration of antihypertensive medications.

Keyword: *Hypertension, Chronotherapy, Bedtime Dosing, Morning Dosing, Cardiovascular Outcomes*

PD-097

Distinguishing True Resistant Hypertension from Pseudoresistant Hypertension: A Systematic Review of Diagnostic Strategies and Clinical Reclassification

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Abstract

Background: True resistant hypertension (RH) remains challenging to identify in clinical practice despite clear guideline criteria. Reliance on office blood pressure (BP) measurement alone frequently leads to misclassification due to pseudoresistant from poor measurement techniques or white-coat effects. Consequently, RH is often overdiagnosed, resulting in overtreatment, unnecessary investigations, and increased healthcare costs.

Objectives: This systematic review aims to evaluate various diagnostic tools used in the prior studies regarding RH in order to determine whether

the patients diagnosed with the condition truly have uncontrolled BP despite being prescribed three or more medications.

Methods: A systematic search was performed on PubMed, Scopus, and JAMA Network up to January 2026. The concept terms included “Resistant Hypertension”, “Pseudoresistant”, “Diagnostic Strategies”, and “Sensitivity and Specificity”. Risk of bias was assessed with the Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2) tool.

Results: Six studies from Brazil, Australia, and South Korea were included in the review. Out- of-office BP monitoring led to significant diagnostic reclassification, with 19–58% of patients initially identified as having RH subsequently reclassified as pseudoresistant, predominantly attributable to the white-coat effect. Ambulatory blood pressure monitoring (ABPM) confirmed true RH in only 35–65% of cases. Home blood pressure monitoring (HBPM) demonstrated strong concordance with ABPM, characterized by high specificity but moderate sensitivity, thereby necessitating ABPM confirmation for elevated readings.

Conclusion: Assessment based solely on office BP frequently overestimates RH. Incorporating ABPM/HBPM before intensifying therapy may reduce misclassification and avoid overtreatment.

Keyword: *Resistant Hypertension, Pseudoresistant, Diagnostic Strategies, Blood Pressure.*

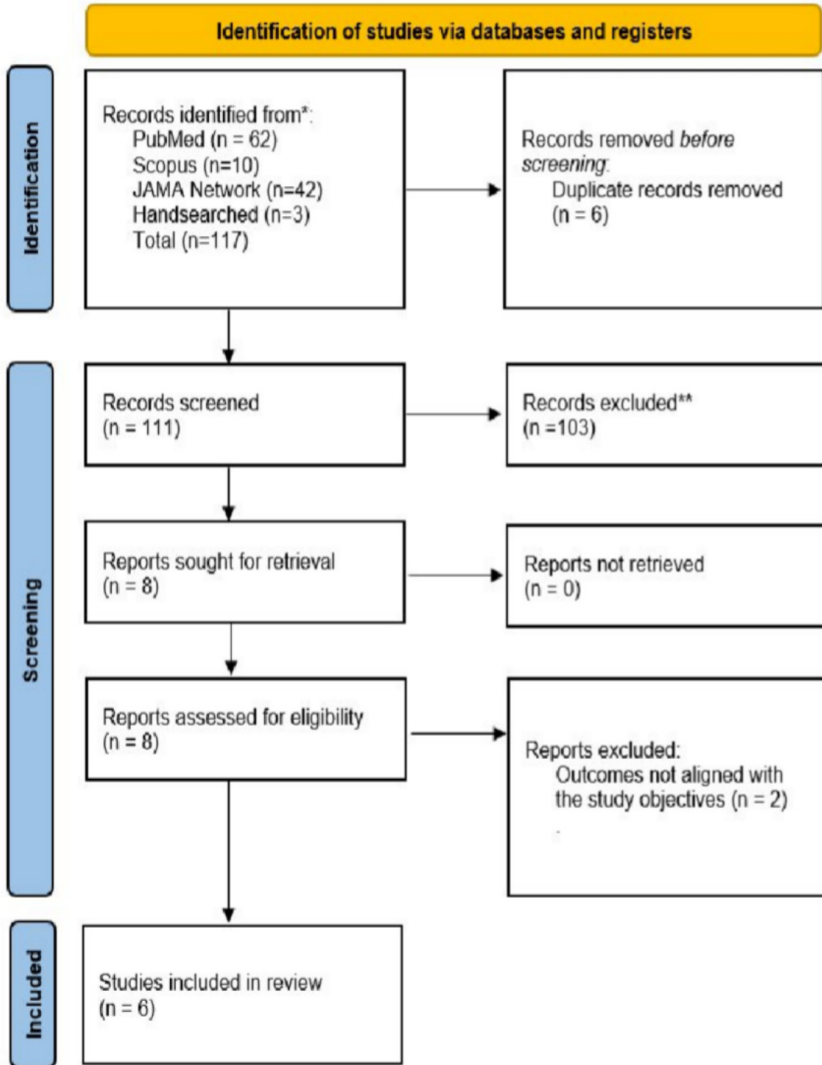
References

1. Kim H, Shin J. Role of home blood pressure monitoring in resistant hypertension. *Clin Hypertens.* 2023;29:2. doi:10.1186/s40885-022-00226-1.
2. Carey RM, Calhoun DA, Bakris GL, Brook RD, Daugherty SL, Dennison-Himmelfarb CR, et al. Resistant hypertension: detection, evaluation, and management: a scientific statement from the American Heart Association. *Hypertension.* 2018 Nov;72(5):e53–e90. doi:10.1161/HYP.0000000000000084.

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3. Mezzetti A, Pierdomenico SD, Costantini F, Romano F, Bucci A, Di Gioacchino M, et al. White-coat resistant hypertension. *Am J Hypertens.* 1997 Nov;10(11):1302–7. doi:10.1016/S0895-7061(97)00318-X.
4. Muxfeldt ES, Bloch KV, Nogueira AR, Salles GF. True resistant hypertension: is it possible to be recognized in the office? *Am J Hypertens.* 2005 Dec;18(12 Pt 1):1534–40. doi:10.1016/j.amjhyper.2005.06.013.
5. Muxfeldt ES, Barros GS, Viegas BB, Carlos FO, Salles GF. Is home blood pressure monitoring useful in the management of patients with resistant hypertension? *Am J Hypertens.* 2015 Feb;28(2):190–9. doi:10.1093/ajh/hpu145.
6. Brown MA, Buddle ML, Martin A. Is resistant hypertension really resistant? *Am J Hypertens.* 2001 Dec;14(12):1263–9. doi:10.1016/S0895-7061(01)02193-8.
7. Rodrigues CS, Bloch KV, Nogueira AR. Office blood pressure and 24-hour ambulatory blood pressure measurements: high proportion of disagreement in resistant hypertension. *J Clin Epidemiol.* 2009 Jul;62(7):745–51. doi:10.1016/j.jclinepi.2008.09.009.
8. Marui FR, Bombig MT, Francisco YA, Thalenberg JM, Fonseca FA, Souza DD, et al. Assessment of resistant hypertension with home blood pressure monitoring. *Arq Bras Cardiol.* 2010 Oct;95(4):536–40. Portuguese, English. doi:10.1590/S0066-782X2010005000120.
9. Seo J, Lee CJ, Kim DH, Kim SY, Moon JY, Park JH, et al. Discrepancies between home blood pressure and ambulatory blood pressure monitoring in apparent treatment-resistant hypertension: analysis from the Korean resistant hypertension cohort. *Hypertens Res.* 2025 Jan;48(1):37–48. doi:10.1038/s41440-024-02017-7.

Attachments
 PRISMA Flowchart



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Quality Assessment of Diagnostic Accuracy Studies-2 (QUADAS-2) Tool

Study	Risk of Bias Domain			
	D1	D2	D3	D4
Muxfeldt, et al., 2005	+	+	+	+
Muxfeldt, et al., 2015	+	+	+	+
Brown et al., 2001	-	-	-	X
Rodrigues et al., 2009	+	-	+	+
Marui et al., 2010	-	-	-	+
Seo, Jiwon et al., 2024	-	+	+	-

Domains:

- D1: Bias due to participation.
- D2: Bias due to index test.
- D3: Bias due to reference standards.
- D4: Bias due to flow and timing.

Judgement:

- X High
- Unclear
- +

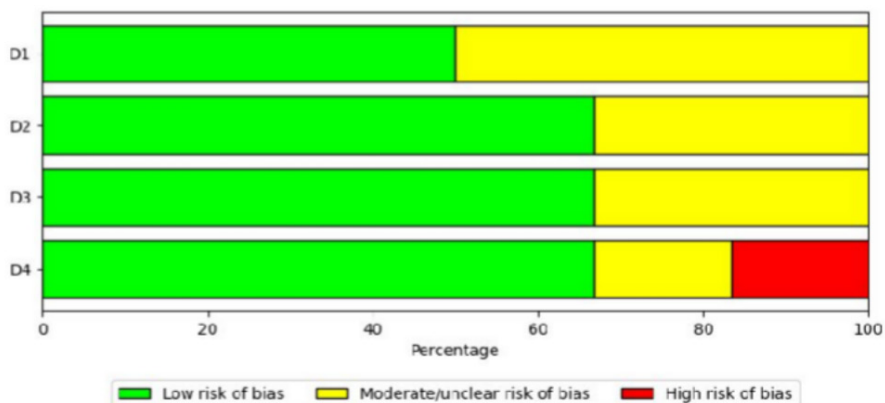


Table 1. Summary of Included Studies' Characteristics and Findings

Author (Year)	Country	Study Design	Population (n, characteristics)	Definition of Suspected Resistant Hypertension	Index/Diagnostic Strategy	Reference/Comparator	Definition of Pseudoresistant
Muxfeldt, et al., 2005	Brazil	Cross-sectional study	Adult (n=497) resistant hypertensive patients diagnosed at the hospital clinic.	Uncontrolled office blood pressure (BP) despite use of an optimal regimen with ≥ 3 antihypertensive drugs at full dosages, and at least one is a diuretic.	Office BP. Clinical Laboratory Variables (e.g. serum potassium, fasting glucose, microalbuminuria)	24-hour Ambulatory Blood Pressure Monitoring (ABPM)	Defined as white coat RH: Office BP $\geq 140/90$ mmHg but having a controlled man ambulatory BP ($\geq 135/80$ mmHg).
Muxfeldt, et al., 2015	Brazil	Cross-sectional study	Adult (n=240) resistant hypertensive patients from a cohort at the hospital clinic.	Uncontrolled office BP despite the use of an optimal regimen with ≥ 3 antihypertensive drugs or use of ≥ 4 antihypertensive drugs, ideally including a diuretic, regardless of office BP levels.	5-Day Protocol of Home Blood Pressure Monitoring (HBPM) with triplicate morning and evening measurements.	ABPM	Defined as white-coat resistant hypertension: Office BP $\geq 140/90$ mmHg but daytime or home BP $<135/85$ mmHg on ABPM or HBPM.
Brown et al., 2001	Australia	Observational cross-sectional study	Adults referred for ABPM (n = 611); subgroup with suspected resistant hypertension on ≥ 3 drugs (n = 118).	Uncontrolled office BP on ≥ 3 antihypertensive drugs, classified as resistant hypertension and referred for ABPM confirmation.	24-hour ABPM	Clinic BP measured by the referring physician and a trained nurse.	Apparent resistant hypertension with controlled ABPM (awake BP $<135/85$ mmHg, secondary: 24-h BP $<125/80$ mmHg).

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Rodrigues et al., 2009	Brazil	Observational cohort study	Adults (n= 298) with resistant hypertension despite regular use of ≥ 3 antihypertensive drugs, including diuretic, in adequate doses.	Uncontrolled office BP ($\geq 140/90$ mmHg) on ≥ 3 antihypertensive drugs, including diuretic.	Office BP	Daytime ambulatory BP	Defined as white-coat resistant hypertension: Office BP $\geq 140/90$ mmHg and daytime ambulatory BP $<135/85$ mmHg on 24-hour ABPM.
Marui et al., 2010	Brazil	Cross-sectional, comparative study	Adults (n= 51) with resistant hypertension despite regular use of ≥ 3 antihypertensive medications at optimal doses, including a diuretic.	Persistently elevated office BP (SBP ≥ 140 mmHg, and/or DBP ≥ 90 mmHg, or $\geq 130/80$ mmHg in patients with diabetes or renal disease) despite treatment with at least three antihypertensive agents of different classes, including a diuretic at optimal doses.	HBPM, three BP measurements were taken in the morning and at night for five consecutive days.	ABPM, programmed to take BP every 15 minutes (daytime) and every 30 minutes (nighttime) for 24 hours.	An apparent lack of blood pressure control on office measurement, often due to poor measurement technique, inadequate treatment adherence, or the white-coat effect.
Seo, Jiwon et al., 2024	Korea	Cross-sectional, prospective, multicenter, cohort study	Adults (n = 1,457) with resistant hypertension treated with ≥ 3 antihypertensive medications including a diuretic, or ≥ 4 medications regardless of BP. A total of 823 patients with complete data for office BP, 24-h ABPM, and home BP as baseline workups were included in the final analysis.	Having uncontrolled office BP $\geq 130/80$ mmHg despite receiving three classes of antihypertensive drugs, including diuretics, and whose BP achieves target values on receiving ≥ 4 classes of antihypertensive medication.	HBPM, twice daily in the morning and evening, for 7 consecutive days before the hospital visits.	ABPM was performed every 30 min and averaged for 24-h (daytime & nighttime periods).	Apparent treatment-resistant hypertension caused by falsely elevated office blood pressure, most commonly due to the white-coat effect or poor medication adherence.

Table 2. Summary of Key Outcomes and Clinical Implications

Author	Key Outcomes	Clinical Implications
Muxfeldt, et al., 2005 (Brazil)	<p>63% patients were classified as true resistant hypertension (RH), while 37% patients were classified as white-coat hypertension. Patients' characteristics such as gender (men), high office SBP (≥ 180 mmHg), high fasting glucose (≥ 7.0 mmol/L), low serum potassium (< 4.5 mmol/L), and the presence of target organ damage (microalbumin/24h proteinuria and detected LVH) could become the predictors of RH by making it a scoring system as the difference between the true RH and white-coat RH is significant.</p> <p>Patients with a score ≥ 4 are classified as true RH with a sensitivity of 32% and a specificity of 92%.</p>	<p>The scoring system can be used as a tool to help determine true RH patients in areas with limited resources for ABPM. As it has a low rate of misclassification, it could save 25 % of RH patients from being referred to ABPM. However, as the true RH and white coat RH may change over time, the RH patients need to receive careful and consistent follow-up. Furthermore, as the scoring system has not yet been externally validated, the physicians should use the scoring to stratify the probability of true RH rather than use it as a sole diagnostic tool for RH.</p>
Muxfeldt, et al., 2015 (Brazil)	<p>HBPM showed a high specificity for patients with controlled HBPM (controlled RH and white-coat RH) with a high positive predictive value and positive likelihood ratio.</p> <p>Using HBPM, 23% were classified as white-coat RH compared to the ABPM, which shows 36%.</p> <p>HBPM results are linked with ABPM in determining the reclassification of RH patients. However, it tends to overestimate SBP by a mean of 9 mmHg.</p>	<p>HBPM is a useful tool for managing RH patients, especially for long-term follow-up and determining the durability of BP control for patients with controlled ambulatory blood pressure, without the need to repeat ABPM. However, it cannot replace ABPM as the primary tool for detecting RH.</p>
Brown et al., 2001 (Australia)	<p>Among apparent RH, 28% showed pseudoresistant by awake ABPM, decreasing to 19% with stricter 24-h criteria.</p> <p>Mean systolic white-coat effect ranged from 16-26 mmHg for physician-measured BP and 9-17 mmHg for nurse-measured BP.</p>	<p>ABPM reclassified 25-30% of apparent RH as controlled, indicating that early implementation of ABPM can limit unnecessary treatment escalation and evaluation for secondary hypertension, as clinic BP measurements are influenced by a significant white-coat effect.</p>

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Author	Key Outcomes	Clinical Implications
Rodrigues et al., 2009 (Brazil)	There is a large difference between office BP and daytime ambulatory BP values. The differences increase as the BP level increases and are higher for the white-coat RH patients than for the true resistant ones.	The survival agreement method used in the agreement evaluation allows the physicians to choose the tolerance limits that are clinically more acceptable and adequate to his/her practice. Although office BP has limitations, it is still useful for the classification of noncontrol in patients initially diagnosed as true RH. Ambulatory BP may be optimized and used only in situations where office BP is not sufficient to support a clinical decision.
Marui et al., 2010 (Brazil)	HBPM showed a strong positive correlation with ABPM in measuring systolic and diastolic BP. In confirming RH, Among 51 patients, ABPM identified 33 patients with RH, whereas HBPM identified 37 patients, indicating comparable diagnostic performance. For the diagnosis of RH, HBPM showed a sensitivity of 100% and a specificity of 77.8%.	Clinical practice requires the use of ABPM or HBPM to accurately identify pseudoresistant, such as that caused by the white-coat effect. Based on the results obtained, HBPM can be considered a useful tool for diagnosing true RH and may positively influence patients' adherence to prescribed treatment.
Seo, Jiwon et al., 2024 (Korea)	Among patients with controlled office BP treated with ≥ 4 antihypertensive medications, a high prevalence (68%, 125/184) of masked uncontrolled hypertension was revealed. Significant discrepancies between ABPM and HBPM could lead to misclassification if only one modality is used. Using a home BP threshold of $\geq 130/80$ mmHg, the sensitivity and specificity for diagnosing RH were 69.2% and 64.9%, respectively.	Relying solely on home or ambulatory blood pressure control status may be insufficient for assessing BP management. Instead, the combined use of HBPM and ABPM may enable more optimal blood pressure control in patients with RH.

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Effect of Morning Versus Evening Exercise on Blood Pressure: A Systematic Review and Meta-Analysis

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ABSTRACT

Background: Exercise is a widely accessible and effective intervention for reducing blood pressure, and its benefits have been extensively documented in both clinical studies and practice guidelines. However, evidence-based recommendations on the optimal timing of exercise remain limited, particularly regarding potential differences in blood pressure-lowering effects between morning and evening exercise. Therefore, a comparative evaluation of their effects is necessary to address this existing evidence gap.

Objective: To compare the effects of morning versus evening exercise on blood pressure.

Method: This systematic review and meta-analysis were conducted in accordance with PRISMA guidelines. PubMed, Scopus, and EBSCOhost were systematically searched for literature comparing morning versus evening exercise on blood pressure outcomes. A meta-analysis was performed using Review Manager, with pooled mean differences (MDs) and 95% confidence intervals (CIs) calculated for systolic blood pressure outcomes. Statistical heterogeneity was assessed using the I^2 statistic.

Results: Five studies were included in the systematic review, of which 3 contributed to the meta-analysis. While some studies reported greater benefits of morning exercise for acute systolic blood pressure reduction, other studies favored evening exercise for nocturnal and ambulatory blood pressure control. These divergent findings are reflected in the

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pooled analysis for systolic blood pressure, which showed a non-significant overall effect with substantial heterogeneity (MD -3.45, 95% CI -8.86 to 1.96; $I^2 = 77\%$).

Conclusion: Exercise timing influences blood pressure regulation through distinct mechanisms, with varying advantages at different times. Future standardized randomized trials are needed to identify the optimal timing of exercise.

Keyword: Exercise, Morning, Evening, Blood pressure.

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Visit-to-Visit Blood Pressure Variability and Adverse Maternal and Neonatal Outcomes in Pregnancy: A Systematic Review and Meta-Analysis

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Background: Studies have associated high blood pressure variability (BPV) with an increased risk of adverse cardiovascular outcomes. However, the prognostic value of visit-to-visit BPV in pregnancy remains unclear.

Objective: This study aimed to evaluate the prognostic value of visit-to-visit BPV for adverse maternal and neonatal outcomes in pregnant women.

Method: We conducted a systematic search up to December 2025 across three databases for studies reporting associations between visit-to-visit BPV and pregnancy outcomes. Composite maternal and neonatal outcomes, gestational hypertension, preeclampsia, severe

hypertension, preterm birth, NICU admission, and neonatal death were pooled as odds ratios (ORs) using a random-effects model.

Result: A total of 10 cohort studies involving 155,270 pregnant women were included. The mean age was 28.9 ± 5.1 years, with mean systolic and diastolic blood pressures of 111.53 ± 9.53 mmHg and 68.5 ± 6.8 mmHg, respectively. Higher visit-to-visit BPV, assessed using standard deviation was significantly associated with increased risks of composite maternal outcomes (OR 1.42, CI 1.22–1.65) which includes gestational hypertension (OR 1.38), preeclampsia (OR 1.20), and severe hypertension (OR 1.60), all of which with $p < 0.05$. Increased risks were also observed for composite neonatal outcomes (OR 1.11, CI 1.07–1.15) which includes preterm birth (OR 1.12), NICU admission (OR 1.09), and neonatal death (OR 1.12), all of which with $p < 0.05$. Similar associations were observed when BPV was assessed using other BPV parameters, including average real variability and variation independent of mean.

Conclusion: Higher BPV, measured as visit-to-visit variability, is significantly associated with adverse maternal outcomes and increased risks of neonatal complications in pregnancy.

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Which Exercise is The Best for Lowering Blood Pressure in Adults with Obesity- or Overweight-Related Hypertension? A Systematic Review and Network Meta-Analysis of 14 Different Exercise from 32 Randomized Controlled Trials

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Background: Hypertension and obesity are two major global health issues. While physical activity is a key non-pharmacological intervention, evidence on the most effective exercise type for blood pressure control

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in adults with obesity- or overweight-related hypertension remains unclear.

Objective: To systematically compare and rank the effectiveness of different exercise modalities in lowering blood pressure specifically in adults with obesity- or overweight-related hypertension.

Methods: This systematic review and network meta-analysis followed PRISMA guidelines. A comprehensive searching through PubMed, Scopus, ScienceDirect, and EBSCOhost up to September 2025. Analyses were conducted using RStudio, with effects reported as mean differences (MD) and 95% confidence intervals (CI). Comparative effectiveness was ranked using the Surface Under the Cumulative Ranking Curve (SUCRA).

Results: For SBP reduction, Tai Chi (MD = -12.75 mmHg; 95% CI: -28.13 to 2.63) and Yoga (MD = -10.87 mmHg; 95% CI: -26.62 to 4.88) showed the largest effects, though with wide confidence intervals. Moderate-Intensity Continuous Training (MCT) demonstrated a significant reduction (MD = -6.38 mmHg; 95% CI: -10.93 to -1.83). For DBP, Yoga (MD = -9.62 mmHg; 95% CI: -17.65 to -1.59) and Tai Chi (MD = -7.81 mmHg; 95% CI: -14.83 to -0.79) were most effective, followed by combined training (MCT + RT).

Conclusion: Mind-body exercises and combined aerobic-resistance are highly effective for blood pressure reduction in adults with obesity- or overweight-related hypertension. MCT significantly lowers SBP, while MCT + RT significantly reduces DBP. These approaches should be prioritized in exercise prescriptions for this population.

Keywords: *hypertension, obesity, exercise, meta-analysis, blood pressure.*

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FROM HYPERTENSIVE PREGNANCY TO CARDIAC ARRHYTHMIA: A SYSTEMATIC REVIEW AND META-ANALYSIS OF ATRIAL FIBRILLATION RISK**Hafidha Camila Arif¹, Sinta Septerina Permatasari², Fayola Issalillah³**¹*Primary Care Department, Bantur Primary Health Care Center, Malang, Indonesia*²*Emergency Medicine Department, Mitra Delima General Hospital, Malang, Indonesia*³*Emergency Medicine Department, Aisyiyah Hospital, Bojonegoro, Indonesia*

Background: Hypertensive disorders of pregnancy (HDP) are associated with increased neonatal and maternal risks and long term cardiovascular morbidity, including gestational hypertension and preeclampsia. The evidence suggests that HDP predisposes to cardiac arrhythmia, particularly atrial fibrillation (AF). However, the magnitude of this risk remains unclear. This systematic review and meta-analysis aimed to evaluate the risk of atrial fibrillation in women with hypertensive disorders of pregnancy.

Methods: A comprehensive literature search was conducted from PubMed, ScienceDirect, and Google Scholar. Eligible studies were cohort studies assessing the incidence of atrial fibrillation among women with a history of hypertensive disorders of pregnancy among normotensive pregnancies. Study quality was assessed using Newcastle Ottawa scale. Pooled risk ratios (RR) were calculated using a random effect model in RevMan. Heterogeneity was assessed using I² statistics. Subgroup analysis was conducted according to HDP subtype and associated risk factors.

Results: Seven studies were pooled and demonstrated that women with a history of HDP had significantly higher risk of developing atrial fibrillation compared to normotensive pregnancies (RR 1.63, 95% CI 1.34-

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1.98, $I^2 = 75\%$). Analyses of HDP subtypes demonstrated significantly increased risk among women with gestational hypertension (RR 1.40, 95% CI 1.20-1.62, $I^2 = 6\%$) and preeclampsia (RR 1.53, 95% CI 1.32-1.78, $I^2 = 10\%$). Cardiometabolic risk factors showed no significant association between atrial fibrillation risk and body mass index (RR 1.66, 95% CI 0.81-3.40, $I^2 = 83\%$) or gestational diabetes (RR 1.36, 95% CI 0.69-2.72, $I^2 = 88\%$).

Conclusion: A history of hypertensive disorder of pregnancy is correlated with a substantially increased risk of atrial fibrillation later in life.

Keywords: hypertensive disorders of pregnancy, atrial fibrillation, systematic review, meta-analysis.

Figure 1.1 Overall Association: HPD vs Atrial Fibrillation

1.1 HPD vs AF

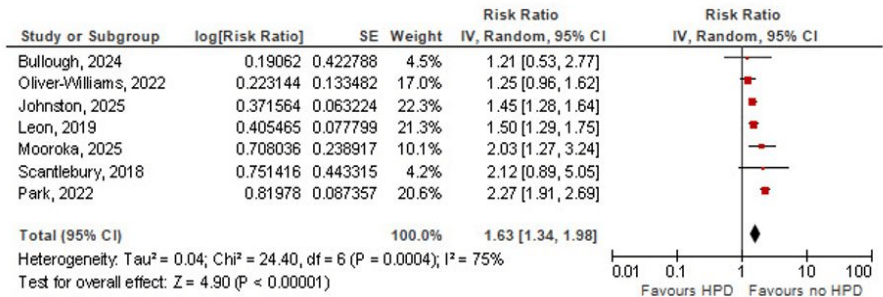


Figure 1.2 Subgroup Analysis: HPD Subtypes

1.2 Subtype HPD

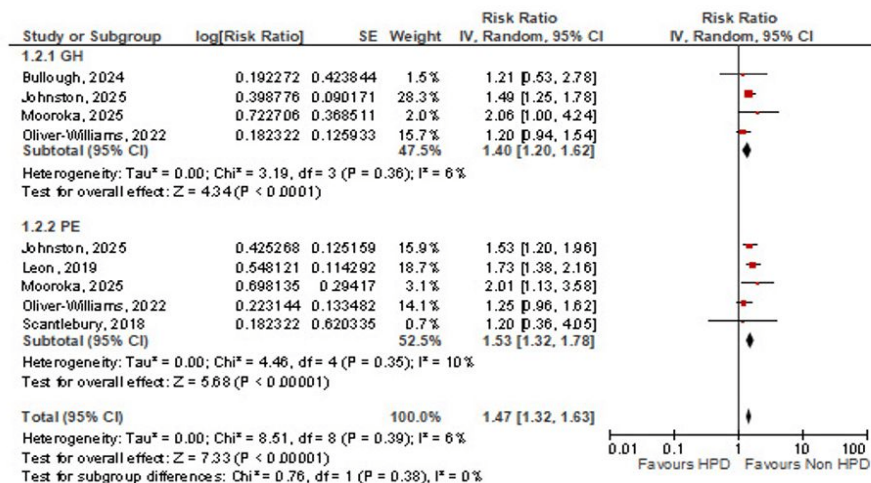
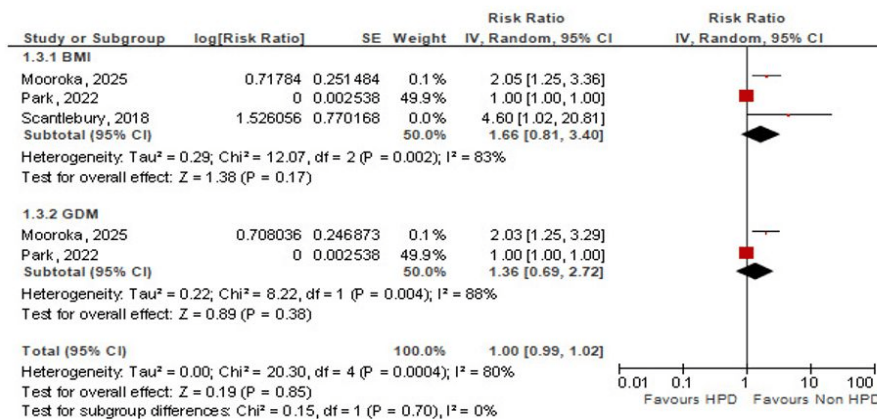


Figure 1.3 Risk Factor Analysis

1.3 Risk Factor



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POST-MARATHON CARDIAC BIOMARKERS IN RUNNERS WITH EXERCISE-INDUCED HYPERTENSION: A SYSTEMATIC REVIEW

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Background: Exercise-induced hypertension (EIH), characterized by an exaggerated blood pressure response during exercise, is frequently observed in endurance athletes, including marathon runners. EIH has been hypothesized to reflect increased vascular load and myocardial wall stress during exercise. Cardiac biomarkers are sensitive indicators of myocardial stress and injury, yet evidence regarding their association with EIH remains limited and heterogeneous.

Objectives: This review aimed to systematically evaluate current evidence comparing post-marathon cardiac biomarker responses in adult runners with exercise-induced hypertension versus normotensive controls.

Methods: A systematic review was conducted up to December 2025 across five databases (PubMed, ScienceDirect, and Scopus) in accordance with PRISMA guidelines. Risk of bias was assessed using ROBINS-E. Due to substantial clinical and analytical heterogeneity, findings were synthesized using harvest plots.

Results: Five observational studies (four cohort and one cross-sectional) comprising 137 runners were included. Post-marathon concentrations of troponin I (cTnI) and NT-proBNP increased in both normotensive and EIH runners. Harvest plot synthesis showed that a minority of studies reported greater post-exercise biomarker increases in the EIH group, whereas most studies demonstrated no significant between-group differences. No studies reported lower biomarker responses in EIH runners.

Conclusions: Cardiac biomarkers consistently increase following marathon running, but evidence supporting a greater biomarker response in runners with exercise-induced hypertension is limited and inconsistent. Recognition of EIH may help identify runners who could benefit from closer cardiovascular monitoring. Further studies are required to clarify prognostic implications and long-term cardiovascular risk.

Keyword: Exercise-induced hypertension; Cardiac biomarkers; Marathon running; Troponin; Myocardial stress

PD-103

Unravelling Uromodulin's Role as Genomic-Guided Therapy in Salt-Sensitive Hypertension: A Systematic Review of Mendelian Randomization

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ABSTRACT

Background: Hypertension is a major cardiovascular risk factor, with many patients showing resistance to conventional treatments. Uromodulin (UMOD), a kidney-derived protein, regulates sodium reabsorption via ion transporters involved in salt-sensitive hypertension. Genetic variants in the UMOD gene influence uromodulin levels, suggesting its potential as a target for hypertension therapies.

Objectives: This review investigates the causal link between uromodulin levels and hypertension through Mendelian Randomization (MR) studies and explores its therapeutic potential in precision medicine.

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Methods: A systematic review without meta-analysis (SWiM) was conducted, searching PubMed, Scopus, Cochrane, and Google Scholar for MR studies focusing on uromodulin and hypertension. Articles were screened and evaluated for bias by independent reviewers.

Results: Three MR studies were analyzed. Elevated uromodulin levels were causally linked to increased systolic blood pressure ($\beta = 1.10$, $p < 0.001$) and hypertension risk (OR = 1.036, $p < 0.001$). Genetic variants, particularly UMOD SNPs rs12917707 and rs4494548, were associated with higher uromodulin levels and blood pressure. Mediation analysis confirmed uromodulin’s role in sodium reabsorption, with 69% and 87% of myocardial infarction risk mediated by systolic and diastolic blood pressure, respectively.

Conclusion: Uromodulin is a promising target for genomic-guided hypertension therapy, particularly in salt-sensitive cases. Precision medicine incorporating UMOD genotypes may enhance therapeutic outcomes by targeting sodium retention pathways.

Keywords: Uromodulin, Hypertension, Mendelian Randomization, Genomic-guided therapy, Precision medicine.

Table 1. Summary of Mendelian Randomization of Uromodulin and Hypertension Association

Reference	Number of SNPs (IVs)	Exposure Data Source	Outcome(s)	MR Analysis	Effect Size (OR/ β) and p-value
You et al., 2021	2 SNPs (rs12917707, rs4494548)	Urinary Uromodulin (uUMOD)	Hypertension, SBP, DBP	IVW, MR-Egger, Weighted Median, MR-PRESSO	OR = 1.036 (Hypertension, $p < 0.001$) SBP: $\beta = 1.10$, DBP: $\beta = 0.88$, $p < 0.001$
Jian et al., 2022	Multiple SNPs	Urinary Uromodulin	Myocardial Infarction, Mediated by BP	Bidirectional MR, Multivariable MR	OR = 1.08 (MI, $p = 0.009$), 69% mediation by SBP, 87% by DBP
Sjaarda et al., 2020	16 SNPs (after LD pruning)	Serum Uromodulin (sUMOD)	SBP, DBP, Hypertension	IVW, MR-Egger, Weighted Median	SBP: $\beta = 0.371$, DBP: $\beta = 0.313$, Hypertension OR = 1.013 ($p < 0.001$)

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Machine Learning–Based Predictive Models for Hypertension Risk Stratification Using Ambulatory Blood Pressure Monitoring: A Systematic Review

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Backgrounds: Hypertension remains a global health burden, highlighting the need for precise risk assessment. Machine learning (ML) approaches have emerged as promising tools to improve risk stratification and individualized management of hypertension-related complications. Integrating ambulatory blood pressure monitoring (ABPM) data with clinical parameters, ML-based predictive models show promising potential in identifying high-risk patients.

Objectives: This study aims to evaluate the predictive performance of machine learning in risk stratification of hypertension-related complications.

Method: This review followed PRISMA guidelines across PubMed, Scopus, and Cochrane databases over the years. Cohort studies evaluated the use of machine learning (ML) and ABPM for risk stratification in hypertension and its complications were included. Risk of bias was assessed using the ROBINS-I tool, and data were extracted for systematic analysis.

Results: Five studies met the inclusion criteria. Across three studies, ML demonstrated superior performance compared with conventional risk scores, with a pooled difference in area under the curve (Δ AUC) of 0.17 (95% CI 0.05–0.29). One study demonstrated high diagnostic accuracy of ML-based classification for hypertensive patients with and without complications using ABPM data, with an accuracy of 98.4% under 10-fold cross-validation. Another study reported high predictive performance for hypertension-related target organ damage using both

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random forest and artificial neural network models.

Conclusion: Machine learning demonstrates high accuracy in risk stratification of hypertensive patients, both independently and compared with conventional risk scores. Integrating ABPM data into machine learning-based models could further support clinical decision-making and provide valuable insights for future personalized hypertension management.

Keywords: hypertension, machine learning, risk stratification, ambulatory blood pressure monitoring

PD-105

Sex-Specific Blood Pressure Responses to RAAS Inhibitors versus Non-RAAS Antihypertensives: A Systematic Review and Meta-Analysis

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ABSTRACT

Background: Despite equivalent treatment intensity, women achieve poorer blood pressure control than men, contributing to persistent sex disparities in cardiovascular outcomes. The renin-angiotensin-aldosterone system exhibits pronounced sexual dimorphism, with estrogen suppressing renin activity and angiotensin II production

while upregulating protective ACE2-Ang-(1-7)-MasR pathways. These biological differences suggest sex-specific antihypertensive responses may exist, particularly for RAAS-targeting therapies.

Objective: This study aimed to investigate sex-specific differences in antihypertensive efficacy by comparing blood pressure responses to RAAS-targeting agents and non-RAAS therapies, and to explore the potential modifying effects of sex and menopausal status through meta-analytic interaction testing.

Methods: We systematically searched MEDLINE (PubMed), Scopus, and ScienceDirect through November 2025 for studies comparing blood pressure responses to RAAS inhibitors (ACE inhibitors/ARBs) versus non-RAAS antihypertensives (calcium channel blockers, diuretics) with sex-stratified data. The primary outcome was the change in systolic blood pressure. A random-effects meta-analysis with interaction testing was used to evaluate sex-specific treatment effects. Menopausal status stratification was performed where available.

Results: Four studies (5 comparisons, n=5,033 participants) met inclusion criteria. In females, RAAS inhibitors reduced systolic blood pressure 5.40 mmHg less than non-RAAS agents (MD 5.40, 95% CI 1.79-9.01, p=0.014), with significant sex × treatment interaction (p=0.031). Males showed no differential response (MD -1.34 mmHg, p=0.66). Sensitivity analysis restricted to monotherapy confirmed robustness (MD 4.68 mmHg, p=0.037). Age-stratified data from one study demonstrated larger effects in women ≥60 years (MD 7.8 mmHg). Subgroup analysis suggested greater female benefit from calcium channel blockers (MD 7.03 mmHg, p=0.08) versus diuretics.

Conclusions: RAAS inhibitors demonstrate inferior systolic blood pressure reduction in females compared with males. These findings suggest potential sex-specific differences in response to RAAS versus non-RAAS antihypertensives, with women showing numerically greater BP reductions with CCBs or diuretics. These hypothesis-generating results require validation in adequately powered prospective trials before informing guideline modifications.

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Keyword: sex differences; hypertension; renin-angiotensin system; antihypertensive agents; blood pressure; estrogen; menopausal status; precision medicine

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Effect of Antihypertensive Chronotherapy on Cardiovascular and Cerebrovascular Outcomes in Hypertensive Patients With and Without Diabetes Mellitus: A Systematic Review and Meta-Analysis

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Background: Hypertension is a major contributor to cardiovascular and cerebrovascular morbidity and mortality, with particularly high risk among patients with diabetes mellitus.¹ Circadian variation in blood pressure and cardiovascular vulnerability suggests that antihypertensive chronotherapy may influence outcomes; however, evidence regarding optimal dosing time remains inconsistent.^{2, 3}

Objectives: Systematically review and meta-analyze antihypertensive chronotherapy effects on cardiovascular and cerebrovascular outcomes in hypertensive patients with and without diabetes mellitus.

Methods: A comprehensive search of PubMed, ScienceDirect, ProQuest, and Scopus identified randomized controlled trials. Participants were adults (≥ 18 years) with hypertension, with or without comorbid diabetes mellitus. Studies comparing bedtime or evening dosing with morning dosing of antihypertensive agents with ≥ 6 months follow-up were included. Evaluated drug classes comprised angiotensin converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARB), calcium channel blockers (CCB), diuretics, and β -blockers,

reporting cardiovascular, cerebrovascular, and blood pressure-related outcomes.

Results: This systematic review and meta-analysis included eight randomized controlled trials, involving 26,336 participants assigned to bedtime dosing and 26,448 assigned to morning dosing. A random effects inverse variance analysis revealed a significantly lower risk with bedtime dosing compared with morning dosing (RR 0.44; 95% CI 0.26–0.76; $p < 0.05$). Significant heterogeneity was well identified ($p = 0.0031$), with 98.8% variability attributed to heterogeneity between studies.

Conclusion: Bedtime chronotherapy showed 45% reduction in major cardiovascular and cerebrovascular events versus morning dosing (RR 0.44, 95% CI 0.26–0.76; $p = 0.0031$). High heterogeneity ($I^2 = 98.8\%$) highlights benefits.

Keywords: Hypertension; Antihypertensive chronotherapy; Bedtime dosing; Morning dosing; Cardiovascular and cerebrovascular outcomes

REFERENCES

1. Shankar S, Aggarwal R, Prakash A, Gulati S, Margekar S, Shailat T. Unmasking the Clock: Diurnal Blood Pressure Variation in Patients With Type 2 Diabetes Mellitus With Hypertension via Ambulatory Blood Pressure Monitoring (ABPM). *Cureus*. 2025;17(10):e94968. Published 2025 Oct 20. doi:10.7759/cureus.94968
2. Asayama K, Satoh M, Kikuya M. Diurnal blood pressure changes. *Hypertens Res*. 2018;41(9):669–678. doi:10.1038/s41440-018-0054-0
3. Schillaci G, Battista F, Settini L, Schillaci L, Pucci G. Antihypertensive drug treatment and circadian blood pressure rhythm: a review of the role of chronotherapy in hypertension. *Curr Pharm Des*. 2015;21(6):756–772. doi:10.2174/1381612820666141024130013
4. Garrison SR, Bakal JA, Kolber MR, Korownyk CS, Green LA, Jessica, et al. Antihypertensive Medication Timing and Cardiovascular Events and Death. *JAMA*. 2025 May 12.

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5. Mackenzie IS, Rogers A, Poulter NR, Williams B, Brown MJ, Webb DJ, et al. Cardiovascular outcomes in adults with hypertension with evening versus morning dosing of usual antihypertensives in the UK (TIME study): a prospective, randomised, open-label, blinded-endpoint clinical trial. *The Lancet* [Internet]. 2022 Oct;400(10361):1417–25. Available from: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(22\)01786-X/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)01786-X/fulltext)
6. Hermida RC, Crespo JJ, Domínguez-Sardiña M, et al. Bedtime hypertension treatment improves cardiovascular risk reduction: the Hygia Chronotherapy Trial. *Eur Heart J*. 2020;41(48):4565-4576. doi:10.1093/eurheartj/ehz754
7. Hermida RC, Ayala DE, Mojón A, Fernández JR. Influence of time of day of blood pressure-lowering treatment on cardiovascular risk in hypertensive patients with type 2 diabetes. *Diabetes Care*. 2011;34(6):1270-1276. doi:10.2337/dc11-0297
8. Hermida RC, Ayala DE, Mojón A, Fernández JR. Bedtime dosing of antihypertensive medications reduces cardiovascular risk in CKD. *J Am Soc Nephrol*. 2011;22(12):2313- 2321. doi:10.1681/ASN.2011040361
9. Hermida RC, Ayala DE, Mojón A, Fernández JR. Influence of circadian time of hypertension treatment on cardiovascular risk: results of the MAPEC study. *Chronobiol Int*. 2010;27(8):1629-1651. doi:10.3109/07420528.2010.510230
10. Hermida RC, Ayala DE, Mojón A, Fernández JR. Sleep-Time Ambulatory BP Is an Independent Prognostic Marker of CKD. *J Am Soc Nephrol*. 2017;28(9):2802-2811. doi:10.1681/ASN.2016111186

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Efficacy of Evening versus Morning Dosing of Renin-Angiotensin System Blockade for Restoring Nocturnal Blood Pressure Dipping in Chronic Kidney Disease: A Systematic Review and Meta-Analysis

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Background: Non-dipping nocturnal blood pressure (BP) is highly prevalent in Chronic Kidney Disease (CKD) and is a strong predictor of cardiovascular mortality. Chronotherapy involving the timing of Renin-Angiotensin System (RAS) blockade administration may mitigate this risk.

Objective: To evaluate the efficacy of evening versus morning dosing of ACE inhibitors or Angiotensin Receptor Blockers (ARBs) in reducing nocturnal systolic blood pressure (SBP) and restoring dipping status in hypertensive CKD patients.

Methods: A systematic review and meta-analysis synthesized data from three clinical studies (randomized and prospective) involving 241 participants. The primary outcome was nocturnal SBP measured by 24-hour ambulatory monitoring. A random-effects model was used to calculate the pooled Mean Difference (MD).

Results: All included studies demonstrated nocturnal SBP reduction with evening dosing. Wang et al. and Aoki et al. reported significant mean differences of -5.0 mmHg and -6.7 mmHg, respectively. Rahman et al. showed a modest reduction of -1.7 mmHg. Crucially, the pooled analysis indicated a significant reduction in nocturnal SBP favoring evening dosing (MD: -3.75 mmHg; 95% CI: -6.90 to -0.61; p=0.02). Improvements in dipping status were observed where BP reduction was significant.

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Conclusion: Evening dosing of RAS blockade is significantly associated with lower nocturnal SBP (mean reduction of 3.75 mmHg) compared to morning dosing in CKD patients. The pooled evidence supports this simple, cost-effective intervention to potentially improve nocturnal hemodynamics and reduce cardiovascular risk.

Keywords: Chronic Kidney Disease, Nocturnal Blood Pressure, Chronotherapy, RAS Blockade, Meta-Analysis, Evening Dosing.

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Angiotensin Receptor Blockers, but not Angiotensin-Converting Enzyme Inhibitors, Are Associated with Improved Survival in Gastric Cancer: A Systematic Review and Meta-Analysis

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Background: Renin-Angiotensin System (RAS) inhibitors, specifically Angiotensin Receptor Blockers (ARBs) and ACE Inhibitors (ACEIs) are widely used drugs for hypertension. While RAS has been associated with cancer progression, the prognostic impact of ARBs and/or ACEIs on survival in gastric cancer remains controversial.

Objective: To evaluate the relationship between ARBs and/or ACEIs use and mortality outcomes in patients with gastric cancer.

Methods: A systematic search was conducted in PubMed, Scopus, and the Cochrane Library up to January 2026, to identify studies linking ARBs and/or ACEIs use to mortality in gastric cancer patients. Risk of bias was assessed using ROBINS-I. Pooled hazard ratios (HRs) were calculated using a random-effects model in RevMan 5.4.

Results: Five observational cohort studies were included in the quantitative synthesis. The pooled HR analysis showed that the use of ARBs and/or ACEIs in gastric cancer patients was associated with 17% reduction in mortality risk (HR 0.83, 95% CI 0.75-0.91, $I^2=35\%$). In subgroup analysis, ARBs group showed strong evidence in improving overall survival (HR 0.76, 95% CI 0.67-0.86, $I^2=0\%$). However, ACEIs use was not significantly associated with improved overall survival (HR 0.95, 95% CI 0.82-1.10, $p=0.46$).

Conclusion: The use of RAS inhibitor drugs can improve survival in gastric cancer patients, but the effect is primarily driven by ARBs, not ACEIs. Further studies are needed to confirm these findings.

Keywords: Angiotensin Receptor Blockers; Angiotensin-Converting Enzyme Inhibitors; survival; gastric cancer.

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Effect of Time Restricted Eating on Blood Pressure in Adults : A Systematic Review and Meta-analysis

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Abstract

Background: Time-restricted eating (TRE) is a pragmatic lifestyle strategy that changes meal timing without prescribing specific foods, making it attractive for real-world hypertension counseling. However, whether TRE meaningfully lowers blood pressure (BP) beyond its effect on body weight remains uncertain.

Objective: To quantify the effects of TRE on systolic BP (SBP) and

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diastolic BP (DBP) in adults; body weight was evaluated as a secondary outcome.

Methods: We conducted a PRISMA 2020–guided systematic review and random-effects meta-analysis of randomized controlled trials comparing TRE (daily eating window ≤ 12 hours) with usual care or non-TRE controls. Pooled mean differences (MD) in change from baseline were calculated using inverse-variance methods.

Results: Twelve studies (651 participants) met inclusion criteria; nine trials RCT were pooled (duration 4 weeks to 12 months; median 8 weeks). TRE did not significantly reduce SBP (MD -0.85 mmHg; 95% CI -2.88 to 1.18 ; $I^2=57.8\%$) or DBP (MD -1.03 mmHg; 95% CI -3.22 to 1.16 ; $I^2=65.1\%$) versus control. Conversely, TRE produced a modest but consistent reduction in body weight (MD -0.84 kg; 95% CI -1.34 to -0.35 ; $I^2=14.4\%$).

Conclusion: This synthesis delivers a clear take-home message for hypertension practice: across available randomized evidence, TRE yields modest weight loss but does not translate into measurable BP lowering, with moderate heterogeneity for BP endpoints. Hypertension-focused trials with standardized TRE timing, antihypertensive management, and BP measurement protocols, including longer follow-up to evaluate durability of effects, are needed to determine whether specific TRE implementations can improve BP control.

Keywords: Time-restricted eating; Blood pressure; Hypertension.

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Optimal Blood Pressure Management After Endovascular Thrombectomy: A Systematic Review and Network Meta-Analysis

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ABSTRACT

Background: Optimal blood pressure (BP) management after endovascular thrombectomy (EVT) in acute ischemic stroke remains controversial, as excessive BP reduction may impair cerebral perfusion, whereas inadequate control increases hemorrhagic risk.

Objective: This systematic review and network meta-analysis compared the effectiveness and safety of different post-EVT BP management strategies and evaluated their net clinical benefit.

Methods: PubMed, Embase, Cochrane Library, Scopus, and Web of Science were searched. Randomized controlled trials and prospective comparative studies were included. Five BP strategies were analyzed: individualized BP, very low BP, low BP, moderate BP, and standard BP. Functional independence at 90 days (modified Rankin Scale [mRS] 0–2) was the primary efficacy outcome, and symptomatic intracranial hemorrhage (sICH) was the primary safety outcome. A frequentist random-effects network meta-analysis was performed, with treatment ranking based on P-scores.

Results: Compared with standard BP, moderate BP showed a nonsignificant trend toward improved functional independence (RR 1.36; 95% CI 0.96–1.94), while individualized BP demonstrated comparable outcomes (RR 1.07; 95% CI 0.69–1.65). Very low BP significantly reduced the likelihood of achieving functional independence (RR 0.78; 95% CI 0.69–0.89). No BP strategy significantly reduced sICH risk. P-score and

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net clinical benefit analyses favored individualized BP management over aggressive BP lowering.

Conclusion: Aggressive BP reduction after EVT may worsen functional outcomes without clear hemorrhagic benefit. Individualized BP management appears to provide the most balanced clinical benefit. Further large-scale trials are needed to define optimal personalized BP targets.

Keywords: Endovascular thrombectomy; blood pressure management; network meta-analysis; functional outcome; intracranial hemorrhage.

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Intensive versus Conventional Blood Pressure Targets in Patients with Established Cardiovascular or Cerebrovascular Disease: A Systematic Review and Meta-Analysis

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Background: In patients with established cardiovascular or cerebrovascular disease, optimal blood pressure targets for secondary prevention remain uncertain. Although intensive blood pressure lowering may further reduce recurrent events in hypertension, concerns persist regarding its safety, tolerability, and heterogeneous outcome effects.¹

Objectives: Evaluate the efficacy of intensive versus standard blood pressure targets in reducing recurrent cardiovascular or cerebrovascular events in patients with prior cardiovascular or cerebrovascular disease.

Methods: Randomized controlled trials were identified through systematic searches of PubMed, ScienceDirect, ProQuest, and Scopus. Included

participants were adults (≥ 18 years) with documented cardiovascular or cerebrovascular disease and without significant comorbid conditions such as diabetes mellitus or chronic kidney disease. Studies comparing intensive and standard systolic blood pressure targets with follow-up of at least 12 months. Antihypertensive treatment evaluated included angiotensin converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARB), calcium channel blocker (CCB), diuretics, β -blockers, and combination regimens.

Results: This systematic review and meta-analysis of eight randomized controlled trials (59,085 participants) demonstrated that intensive blood pressure targets substantially reduced the risk of cardiovascular and cerebrovascular events by 18% compared with conventional targets (RR 0.82, 95% CI 0.76–0.87; $p < 0.0001$). Benefits were consistent across subgroups, with 14% lower cerebrovascular risk (RR 0.86) and 26% lower cardiovascular risk (RR 0.74). Heterogeneity remained low ($I^2 = 3.2\%$).

Conclusion: Intensive blood pressure lowering significantly reduced cardiovascular and cerebrovascular events by 18% compared with conventional therapy, supporting its role in secondary prevention among patients with prior cardiovascular and cerebrovascular disease.

REFERENCES

1. Saiz LC, Gorricho J, Garjón J, Celaya MC, Erviti J, Leache L. Blood pressure targets for the treatment of people with hypertension and cardiovascular disease. *Cochrane Database Syst Rev*. 2022;11(11):CD010315. Published 2022 Nov 18. doi:10.1002/14651858.CD010315.pub5
2. Li, J, Lei, L, Li, Y. et al. Effect of Intensive Blood Pressure Control on Stroke: A Prespecified Secondary Analysis of the ESPRIT Trial. *JACC*. 2025 Oct, 86 (17) 1405–1417.
3. Liu J, Liu J, Liu J, Liu J, Liu J, Liu J, et al. Lowering systolic blood pressure to less than 120 mm Hg versus less than 140 mm Hg in patients with high cardiovascular risk with and without diabetes or previous stroke: an open-label, blinded-outcome, randomised trial. *Lancet*. 2024 Jun 1;404(10449).

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4. Kitagawa K, Yamamoto Y, Arima H, Maeda T, Sunami N, Kanzawa T, et al.; RESPECT Study Group. Effect of standard vs intensive blood pressure control on the risk of recurrent stroke: a randomized clinical trial and meta-analysis. *JAMA Neurol.* 2019;76(11):1309-18. doi:10.1001/jamaneurol.2019.2167
5. Mant J, McManus RJ, Roalfe A, Fletcher K, Taylor CJ, Martin U, et al. Different systolic blood pressure targets for people with history of stroke or transient ischaemic attack: PAST-BP (Prevention After Stroke—Blood Pressure) randomised controlled trial. *BMJ.* 2016 Feb 24;i708.
6. Williamson JD, Supiano MA, Applegate WB, Berlowitz DR, Campbell RC, Chertow GM, et al. Intensive vs Standard Blood Pressure Control and Cardiovascular Disease Outcomes in Adults Aged ≥ 75 Years. *JAMA* [Internet]. 2016 Jun 28;315(24):2673. Available from: <https://jamanetwork.com/journals/jama/fullarticle/2524266>
7. Benavente OR, Coffey CS, Conwit R, Hart RG, McClure LA, Pergola PE, et al.; SPS3 Study Group. Blood-pressure targets in patients with recent lacunar stroke: the SPS3 randomised trial. *Lancet.* 2013;382(9891):507-15. doi:10.1016/S0140-6736(13)60852-1
8. Zhang W, Zhang S, Deng Y, et al. Trial of Intensive Blood-Pressure Control in Older Patients with Hypertension. *N Engl J Med.* 2021;385(14):1268-1279. doi:10.1056/NEJMoa2111437
9. Wright JT Jr, Williamson JD, Whelton PK, Snyder JK, Sink KM, Rocco MV, et al.; SPRINT Research Group. A randomized trial of intensive versus standard blood-pressure control. *N Engl J Med.* 2015;373(22):2103-16. doi:10.1056/NEJMoa1511939.

PD-112

Bedtime vs Morning Dosing of Antihypertensive Therapy for Nocturnal Blood Pressure Control and Dipping Pattern in Adults With Hypertension: A Systematic Review and Meta-analysis of Randomized Trials Using 24-hour ABPM

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ABSTRACT

Background: Nocturnal hypertension and a non-dipping pattern on 24-hour ambulatory blood pressure monitoring (ABPM) are strong predictors of cardiovascular events and target-organ damage, yet they are frequently missed by office BP. The optimal timing of antihypertensive therapy to improve nocturnal BP control remains uncertain, with inconsistent findings across randomized trials, particularly in ABPM-defined phenotypes.

Objective: To compare bedtime versus morning dosing of antihypertensive therapy for (1) nighttime systolic/diastolic BP (SBP/DBP) change and (2) non-dipping status at follow-up, and to assess effects on daytime BP and 24-hour mean BP.

Methods: We searched PubMed and Scopus on 13 January 2026 for RCTs enrolling adults with hypertension assessed by 24-hour ABPM and showing nocturnal hypertension and/or non-dipping at baseline. Trials compared bedtime with morning dosing. Risk of bias was assessed using RoB 2. Data were pooled in RevMan using inverse-variance methods (including generic inverse variance for crossover trials where applicable) and random-effects models.

Results: Eleven trials were included. Bedtime dosing produced greater reductions in nighttime SBP (10 studies; n=2,302; MD -3.86 mmHg, 95% CI -6.36 to -1.37; I²=82%) and nighttime DBP (9 studies; n=1,695;

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MD -1.85 mmHg, 95% CI -3.32 to -0.39 ; $I^2=74\%$) than morning dosing. Daytime SBP/DBP slightly favored morning dosing (MD $+1.15$ and $+0.96$ mmHg; both $I^2=0\%$). No significant differences were found in 24-hour mean BP. Bedtime dosing reduced non-dipping at follow-up (4 studies; $n=1,138$; OR 0.55 , 95% CI $0.43-0.70$), with substantial heterogeneity.

Conclusion: In ABPM-defined nocturnal hypertension/non-dipping, bedtime dosing improves nocturnal BP and dipping status, while effects on daytime and 24-hour mean BP are minimal.

Keywords: *Hypertension, Chronotherapy, Bedtime dosing, Morning dosing, Antihypertensive therapy*

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Blood Pressure–Independent vs Blood Pressure–Mediated Effects of Finerenone in Hypertensive Populations with Kidney Problems: A Meta-Analysis of Randomize Controlled Trials

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Background: Finerenone, a non-steroidal mineralocorticoid receptor antagonist, has shown cardiovascular and renal benefits in in high-risk populations where hypertension is common. Whether blood pressure (BP) reduction varies according to finerenone dose remains insufficiently characterized.

Objective: To systematically synthesise and meta-analyze the effect of finerenone on systolic blood pressure (SBP) and diastolic blood pressure (DBP) in adults with hypertension, and to evaluate whether observed cardio-renal benefits are consistent with BP-mediated versus BP-independent effects.

Methods: A dose-stratified meta-analysis of randomized controlled trials was performed, including three RCTs with a total of 18,899 participants. Changes in SBP and DBP were pooled for each finerenone dose using random-effects models with inverse variance weighting. Effect estimates were expressed as mean differences with 95% confidence intervals (CIs), and heterogeneity was evaluated using the I^2 statistic.

Results: Across included RCTs, finerenone demonstrated modest, dose-related reductions in BP. Higher finerenone doses were generally associated with greater reductions in SBP and DBP compared with lower doses, although the magnitude of BP lowering remained limited. Pooled analyses showed an overall reduction in SBP of -3.27 mmHg (95% CI -4.11 to -2.44) with moderate heterogeneity ($P = 0.09$; $I^2 = 49\%$) and an overall reduction in DBP of -2.69 mmHg (95% CI -4.30 to -1.07) with low-to-moderate heterogeneity ($P = 0.18$; $I^2 = 39\%$). These findings suggest a trend toward dose-dependent BP effects without substantial BP lowering.

Conclusion: In randomized controlled trials, finerenone exhibits modest blood pressure-lowering effects that appear to vary by dose. However, the relatively small magnitude of BP reduction across doses indicates that finerenone's clinical benefits are unlikely to be explained solely by blood pressure lowering.

Keywords: finerenone; dose-response; hypertension; systolic blood pressure; diastolic blood pressure; randomized controlled trials

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Prognostic Value of Non-Dipping Blood Pressure Patterns in Normotensive and Hypertensive Patients With Chronic Kidney Disease: A Systematic Review

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Backgrounds: Non-dipping blood pressure (BP) patterns, highly prevalent in chronic kidney disease (CKD) patients, are independent predictors of cardiovascular risk regardless of average BP levels. It remains unclear whether non-dipping is an independent risk factor for renal outcomes or simply a supporting marker of overall blood pressure. Clarifying this may define whether the dipping pattern should be a therapeutic target.

Objectives: To evaluate the prognostic value of non-dipping blood pressure patterns on renal outcomes among normotensive and hypertensive patients with CKD.

Methods: This review followed PRISMA guidelines across PubMed, Scopus, and Cochrane databases. Cohort studies evaluating non-dipping patterns using ambulatory blood pressure monitoring (ABPM) and renal outcomes in CKD were included. Risk of bias was assessed using the ROBINS-I tool, and quantitative analyses were performed using Review Manager 5.4.

Results : Six studies involving 3,342 patients were included. Across studies, non-dipping was not an independent predictor of renal outcomes but was influenced by BP control. Two studies comparing normotensive and hypertensive groups showed that hypertensive dippers and non-dippers experienced faster renal decline and higher ESRD rates. Pooled analysis of three studies demonstrated that non-

dipping with uncontrolled hypertension increased ESRD risk (HR 1.42, 95% CI (1.19-1.69), $p < 0.0001$). Among controlled patients, non-dippers with on-target BP had lower renal risk than dippers above target.

Conclusion: ABPM highlights the importance of achieving 24-hour BP control in CKD management, emphasizing that optimizing both daytime and nighttime BP through individualized therapy is more clinically relevant than converting dipping patterns.

Keywords : non-dipping blood pressure, hypertension, normotension, renal outcomes

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The Role of TyG-BMI Index and hs-CRP in Identifying High-Risk Groups for Cardio-Kidney-Metabolic (CKM) Syndrome: A Systematic Review and Meta-Analysis

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Background: The Triglyceride-Glucose Body Mass Index (TyG-BMI) and high-sensitivity C-reactive protein (hs-CRP) are emerging as key biomarkers of insulin resistance, adiposity, and inflammation. Both have shown strong associations with cardio-renal-metabolic (CRM)

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outcomes, including up to a 4.24-fold increased risk of chronic kidney disease (CKD) and a 2.4-fold higher hazard of cardiovascular disease (CVD) when combined. Despite these findings, significant gaps remain, including a lack of validation in non-Asian populations and the absence of interventional trials.

Objective: Systematically synthesize the strong evidence linking Triglyceride-Glucose Body Mass Index (TyG-BMI) and high-sensitivity C-reactive protein (hs-CRP) to cardio-renal-metabolic (CRM) outcomes.

Methods: This systematic review and meta-analysis followed PRISMA 2020 guidelines and was registered with PROSPERO (CRD420251113603). Five databases were searched for studies (2015–2025) examining TyG-BMI or hs-CRP in relation to CKM syndrome, mortality, CKD, or CVD. Independent reviewers conducted study selection, data extraction, and risk of bias assessment using the Newcastle-Ottawa Scale (NOS) and Cochrane RoB 2.0. Random-effects meta-analyses and narrative syntheses were conducted, with GRADE used to evaluate evidence certainty.

Results: From 7,196 records, 12 studies were included. TyG-BMI was consistently associated with increased risk of CKM multimorbidity, CKD, and CVD. The combination of high TyG index and hs-CRP conferred multiplicative risk for cardiometabolic multimorbidity (HR=2.1). Comparative analyses found TyG-WHtR often outperformed TyG-BMI for CKD prediction. Meta-analysis of interventions for MACE showed a pooled HR of 0.87 (95% CI: 0.68–1.10), with Bayesian modeling indicating a 99.0% probability of benefit. SUCRA analysis ranked dapagliflozin as the top intervention (score: 0.97).

Conclusion: TyG-BMI is a reliable predictor of adverse CRM outcomes, especially when combined with hs-CRP. However, further interventional studies are needed to validate its clinical utility and assess whether reducing these biomarkers translates into improved outcomes.

Keywords: TyG-BMI, hs-CRP, Cardio-renal-metabolic syndrome.

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Effect of Exercise Videos on Blood Pressure Control in Hypertensive Patients: A Systematic Review

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Introduction: Hypertension affects about one-third of adults globally, with increasing prevalence in low- and middle-income countries. Although digital interventions may help reduce blood pressure, strong evidence of their effectiveness remains limited.

Objective: To evaluate the effectiveness of video-based exercise interventions in reducing blood pressure among adults with hypertension.

Methods: Five electronic databases (Scopus, PubMed, Web of Science, EBSCOHost, and ClinicalTrials.gov) were searched through December 2025, along with reference lists of included studies. Randomized and nonrandomized studies evaluating video-based exercise interventions for blood pressure reduction in adults with hypertension (JNC VII) were included. Studies lacking blood pressure data, using other virtual exercise modalities, or comprising grey literature were excluded. Study quality was assessed using the Cochrane Risk of Bias tool, and meta-analyses with subgroup analyses were conducted where appropriate. The protocol was registered in PROSPERO (CRD420251019897).

Result: A total of 821 papers were identified, and five were included (n = 464). Meta-analysis of systolic blood pressure in the virtual exercise group (n = 292) showed a weighted mean difference (WMD) of -7.26 mmHg (95% CI -15.72 to 1.20), with GRADE indicating very low certainty compared with either alternative treatments and no intervention. For diastolic blood pressure, the pooled WMD was -3.45 mmHg (95%

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CI -11.51 to 4.60; GRADE: very low certainty). Subgroup analysis for SBP showed a significant difference between no-intervention and alternative-intervention groups ($p < 0.01$).

Conclusion: Video-based exercise may reduce blood pressure in hypertensive adults, although the certainty of evidence is very low.

Keyword: Hypertension; Video-Based Exercise; Digital Health Intervention; Virtual Exercise; Meta-analysis

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Hypertensive Disorders of Pregnancy and the Long-Term Risk of Atrial Fibrillation: A Systematic Review and Meta-Analysis of Cohort Studies

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Background: Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia and is associated with substantial global morbidity and mortality. Hypertensive disorders of pregnancy (HDP) are recognized markers of future cardiovascular risk, yet their association with incident AF has not been well characterized.

Objective: This systematic review and meta-analysis aimed to comprehensively synthesize available evidence on the association between HDP and the long-term risk of AF.

Methods: A systematic literature search was conducted in PubMed, Scopus, and the Cochrane Library up to December 2025 to identify cohort studies evaluating the association between HDP and the subsequent risk of AF. Risk of bias was assessed using ROBINS-E. Pooled Hazard Ratios (HRs) with 95% confidence intervals (CIs) were

calculated using a random-effects model.

Results: A total of seven cohort studies fulfilled the inclusion criteria and were included in this review. The meta-analysis demonstrated that women with a history of HDP had a significantly elevated risk of AF compared to those without (HR 1.53; 95% CI: 1.32–1.76). Specifically, significant associations were observed for both preeclampsia (HR 1.37; 95% CI: 1.30–1.43) and gestational hypertension (HR 1.40; 95% CI: 1.15–1.71). Statistical heterogeneity ranged from low to moderate across analyses.

Conclusion: A history of HDP is associated with a significantly increased long-term risk of AF. These findings underscore the clinical importance of HDP as a specific cardiovascular risk factor, suggesting that affected women may warrant enhanced long-term surveillance for AF.

Keywords: Hypertensive Disorders of Pregnancy, Preeclampsia, Gestational Hypertension, Atrial fibrillation

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Efficacy and Safety of Patiromer in Supporting Spironolactone Therapy in Chronic Kidney Disease Patients With Resistant Hypertension: A Systematic Review

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Background: Resistant hypertension is common in chronic kidney disease (CKD), yet optimal therapy is limited by hyperkalemia risk. Spironolactone improves blood pressure control, but usually avoided in

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CKD due to potassium elevation. Patiromer, a non-absorbed potassium binder, may broaden safe access to spironolactone.

Objective: This systematic review evaluates the efficacy and safety of patiromer in supporting spironolactone therapy in CKD.

Method: A systematic search of Lancet, PubMed, and Wiley was conducted in January 2026 using the keywords “Patiromer,” “Spironolactone,” and “Resistant Hypertension.” The main outcomes were to find whether patiromer enabled more persistent use of spironolactone as a treatment and its adverse events (AE). Only English-language studies were included, limited to three randomized controlled trials. Systematic reviews, meta-analyses, case reports, and animal studies were excluded. Study quality was assessed using the Cochrane Risk of Bias 2 (RoB 2.0) tool.

Result: This review analyzed three low risk of bias studies. All studies showed that patiromer has a significant positive effect to enable more persistent use of spironolactone until 12 weeks, with AE such as hyperkalemia and diarrhea being the most prevalent. Only very few treatment related severe and serious AE were found in all studies. One study showed consistent results across two estimated glomerular filtration rate subgroups, another study showed consistent results in patients with or without heart failure.

Conclusion: Patiromer enables a more persistent use of spironolactone with favorable safety profile in the management of CKD patients with resistant hypertension. Further studies are needed as current evidence remains limited.

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Intensive vs. Standard Blood Pressure Lowering in Chronic Kidney Disease: A Systematic Review and Meta- Analysis on Renal and Cardiovascular Outcomes

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Abstract

Background: Chronic kidney disease (CKD) greatly increases cardiovascular (CV) and renal risk, making blood pressure (BP) control central to management. Major guidelines diverge: KDIGO 2021 recommends a systolic BP (SBP) target below 120 mmHg for most adults with CKD and hypertension, whereas the 2023 European Society of Hypertension guideline advises SBP below 140/90 mmHg for all CKD patients and below 130/80 mmHg in selected groups, reflecting uncertainty about the benefit of intensive SBP lowering.

Objective: To assess the CV, renal, and safety effects of intensive (SBP <120 mmHg) versus standard (SBP <140 mmHg) BP targets in adults with CKD stage 3 or higher.

Methods: A systematic review and random-effects meta-analysis of randomized trials and post-hoc CKD subgroup analyses was performed, pooling risk ratios (RRs) with 95% confidence intervals (CIs) for CV events, renal outcomes, and adverse events.

Results: Six studies comprising 5,803 intensive target and 5,760 standard target participants were identified. Intensive SBP lowering reduced composite CV events by 19% (RR 0.81; 95% CI 0.70-0.93) but increased composite renal outcomes (\geq 50% eGFR decline, ESRD,

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or acute kidney injury) by 29% (RR 1.29; 95% CI 1.05-1.59), with low heterogeneity. Non-renal adverse events, including hypotension, syncope, falls, and electrolyte disturbances, were similar (RR 0.97; 95% CI 0.89-1.05).

Conclusion: In CKD stage 3 or higher, intensive SBP targets provide additional cardiovascular protection at the expense of increased renal risk, while non-renal adverse events resemble standard control. Blood pressure targets in CKD should therefore be individualized, balancing cardiovascular benefit against kidney safety.

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Silent Pressure, Fragile Bones: A Meta-Analysis of the Association Between Hypertension and Osteoporosis

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Abstract

Background: Hypertension is a common cardiovascular condition with systemic effects that may influence bone metabolism. However, evidence regarding its association with osteoporosis remains inconsistent.

Objective: To systematically evaluate the association between hypertension and osteoporosis.

Methods: A comprehensive literature search of PubMed, Scopus, EBSCO, and ScienceDirect was performed up to January 12, 2026. Observational studies evaluating the association between hypertension and osteoporosis were included. Univariate and multivariate odds ratio (OR) and hazard ratio (HR), or sufficient raw data for manual calculation, were extracted. Meta-analysis was performed using a random-effects

inverse-variance model with DerSimonian and Laird estimation. Study quality was assessed using the Newcastle–Ottawa Scale. Pooled effect sizes with 95% confidence intervals (CIs) were calculated.

Results: A total of 33 studies involving 523,853 participants were included. In univariate analyses, hypertension was significantly associated with osteoporosis (OR 1.30; 95% CI: 1.05–1.61; $p = 0.015$) and increased risk of incident osteoporosis (HR 2.50; 95% CI: 1.65–3.79; $p < 0.001$). These associations remained statistically significant in multivariate analyses (OR 1.30; 95% CI: 1.14–1.49; $p < 0.001$; HR 1.17; 95% CI: 1.07–1.29; $p < 0.001$). Significant heterogeneity was observed across all analyses; however, sensitivity analyses confirmed the robustness of the results.

Conclusion: Hypertension is independently associated with osteoporosis, indicating that bone health assessment may be warranted in individuals with elevated blood pressure. Further studies are needed to clarify its role in osteoporosis risk stratification.

Keywords: Osteoporosis; Hypertension; Observational studies; Meta-analysis.

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Severe Hypertension With Unusual End-Organ Damage In Young Adult: A Systematic Review

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ABSTRACT

Background: Severe hypertension in youngsters is a rare but serious condition leading to extensive and atypical target organ damage.

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Frequently diagnosed only after the onset of acute complications was found, including cerebrovascular events, renal failure, and cardiac dysfunction. The wide spectrum of clinical manifestations, which may mimic other systemic diseases, often result in delayed diagnosis, while evidence regarding patterns of organ damage in this population remains limited.

Objective : To identify atypical patterns of target organ damage in early-onset severe hypertension.

Method: This systematic review followed PRISMA guidelines using a structured literature search of Google Scholar, ScienceDirect, PubMed, and ProQuest. Studies were selected based on predefined inclusion and exclusion criteria.

Result: In 951 articles identified, nine studies met the inclusion criteria. Four studies reported multi-organ damage causing malignant hypertension, including stroke, renal failure, and thrombotic microangiopathy, requiring aggressive blood pressure reduction. Three studies describe secondary hypertension caused by structural abnormalities such as ureteropelvic junction obstruction and hyperreninemic aldosteronism, leading to severe complications if not properly managed. Two studies highlighted the impact of early-onset hypertension on target organs, including left ventricular hypertrophy and persistent renal damage despite treatment. All of the above emphasizes on early detection, appropriate management, and long-term monitoring in young hypertension patients.

Conclusion: Severe hypertension in young adult is a high-risk condition associated rapid and atypical multisystem target organ damage. Variability clinical manifestations often obscures diagnosis, emphasizing the need for heightened clinical vigilance, thorough evaluation for secondary etiologies, and prompt, well-controlled blood pressure management to prevent serious complications.

Keywords: Severe Hypertension, End-Organ Damage, Young Adult, Hypertension Complication, Unusual Hypertension Complication

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Bridging the Hypertension Control Gap with Digital Self-Management: Comparative Evidence from a Bayesian Network Meta-Analysis

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Abstract

Background: Hypertension remains the leading modifiable risk factor for cardiovascular morbidity and mortality worldwide. However, blood pressure (BP) control is often suboptimal due to poor adherence and limited patient engagement. Digital interventions, including digital self-management (DSM) strategies, offer scalable support for behavior change, medication adherence, and sustained blood pressure control.

Objective: To evaluate the effectiveness of digital self-management interventions on BP reduction and adherence-related outcomes among patients with hypertension.

Method: We searched PubMed, Scopus, Cochrane, Epistemonikos, and ProQuest up to January 2026 for randomized controlled trials (RCTs) evaluating digital interventions reporting systolic blood pressure (SBP) or diastolic blood pressure (DBP). A Bayesian random-effects network meta-analysis estimated pooled mean differences and odds ratios with 95% credible intervals, and risk of bias was assessed using Cochrane RoB 2.0.

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Result: A total of twenty-five RCTs involving approximately 14,697 participants were included. Non self-management digital (NSMD) interventions lowered SBP by -4.3 mmHg ($p<0.001$) and DBP -2.2 mmHg ($p=0.002$), while DSM interventions achieved slightly greater reductions, with SBP decreasing -5.8 mmHg ($p<0.001$) and DBP -3.1 mmHg ($p<0.001$) compared to usual care. DSM and NSMD intervention showed no significant difference in SBP reduction. DSM interventions demonstrated better medication adherence ($p=0.002$) and higher self-efficacy ($p<0.001$) compared with NSMD.

Conclusion: Both DSM and NSMD interventions improve blood pressure control versus usual care. While BP reductions were similar, DSM offered added benefits in adherence, self-efficacy, and engagement. Future research should focus on long-term outcomes, standardization, cost-effectiveness, and scalability.

Keywords: blood pressure control; digital intervention; hypertension; network meta-analysis; self-management.

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Is Uric Acid an Overlooked Culprit? The Association Between Hyperuricemia and Hypertension in Young Adults: A Systematic Review and Meta-Analysis

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Abstract

Background: Hypertension prevalence in young adults is escalating globally. While hyperuricemia is a widely recognized cardiovascular risk factor in older populations, its specific association with blood pressure elevation in young adults (<40 years) remains under-investigated.

Objective To perform a meta-analysis evaluating the magnitude of the association between serum uric acid (SUA) levels and blood pressure in young adults.

Methods: This study followed PRISMA 2020 guidelines. A comprehensive search was conducted across PubMed, Scopus, Cochrane, and ScienceDirect for observational studies involving adults aged 18–40 years. Study quality was assessed using the JBI Critical Appraisal Checklist. We performed a quantitative synthesis using a random-effects model to calculate the pooled weighted Mean Difference (MD) for Systolic (SBP) and Diastolic Blood Pressure (DBP).

Results: From 1,165 identified records, 12 studies met the inclusion criteria, and three high-quality studies (N=4,733) were included in the quantitative meta-analysis. All included studies showed a low risk of bias. The pooled analysis demonstrated that young adults with hyperuricemia had significantly higher blood pressure compared to normouricemic controls. The pooled Mean Difference was 12.06 mmHg (95% CI: 1.76–22.35; $p=0.02$) for SBP and 6.44 mmHg (95% CI: 2.83–10.05; $p<0.001$) for DBP. Significant heterogeneity ($I^2>95\%$) was observed.

Conclusion: Meta-analytic evidence confirms that hyperuricemia is significantly associated with elevated systolic and diastolic blood pressure in young adults. These findings support using serum uric acid as an early biomarker for hypertension risk stratification. Early screening in young populations is recommended to optimize cardiovascular prevention.

Keywords: Hyperuricemia; Hypertension; Young Adults; Uric Acid; Meta-analysis.

Reference

1. Chen, Y.-Y., et al. (2018). The association of uric acid with the risk of metabolic syndrome, arterial hypertension or diabetes in young subjects- An observational study. *Clinica Chimica Acta*, 478, 68–73.

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2. Gaffo, A.L., et al. (2013). Serum Urate Association with Hypertension in Young Adults: Analysis from the Coronary Artery Risk Development in Young Adults Cohort. *Annals of the Rheumatic Diseases*, 72(8), 1321–1327.
3. Ji, X., et al. (2020). Study of correlations between metabolic risk factors, PWV and hypertension in college students. *Clinical and Experimental Hypertension*. <https://doi.org/10.1080/10641963.2020.1723617>
4. Kammar-García, A., et al. (2019). Relationship of hyperuricemia with metabolic alterations and cardiovascular risk factors in a population of Mexican young adults. *Gaceta Médica de México*, 155, 217–222.
5. Krupp, D., et al. (2017). Diet-independent relevance of serum uric acid for blood pressure in a representative population sample. *The Journal of Clinical Hypertension*, 19(10), 1042–1050.
6. Lin, Y.-K., et al. (2020). Sex-specific association of hyperuricemia with cardiometabolic abnormalities in a military cohort: The CHIEF study. *Medicine*, 99(12), e19535.
7. Mustapha, Z., et al. (2024). Association between serum uric acid levels with essential hypertension and its metabolic variables in Hospital Universiti Sains Malaysia. *Original Article* (Accepted: 17 June 2024).
8. Sidoti, A., et al. (2017). BMI, Fat Free Mass, Uric Acid, and Renal Function as Blood Pressure Levels Determinants in Young Adults. *Nephrology*. <https://doi.org/10.1111/nep.12763>
9. Thomas, S.J., et al. (2018). Cumulative Incidence of Hypertension by 55 Years of Age in Blacks and Whites: The CARDIA Study. *Journal of the American Heart Association*, 7(14), e007988.
10. Umar, M., et al. (2025). Elevated Serum Uric Acid Levels as an Analytical Biomarker for Hypertension Risk Among Youth: A Cross-Sectional Study. *Insights-Journal of Health and Rehabilitation*, 3(2).
11. Wang, Y., et al. (2018). Association between urinary sodium excretion and uric acid, and its interaction on the risk of prehypertension among Chinese young adults. *Scientific Reports*, 8, 1434.
12. Zhang, Y., et al. (2019). Clinical characteristics of patients under 40 years old with early-onset hyperuricaemia: a retrospective monocentric study in China. *BMJ Open*, 9, e025528.

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Community-Based Digital Hypertension Care and Renal Outcomes: A Systematic Review and Meta-Analysis of Albuminuria Reduction

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ABSTRACT

Background: Hypertension is a major modifiable risk factor for chronic kidney disease (CKD) progression, especially when long-term treatment adherence is suboptimal. Telemedicine and digital health interventions have been increasingly used to support blood pressure control, improve adherence, and enable early detection of renal deterioration in outpatient and community settings. This systematic review and meta-analysis evaluated the impact of telemedicine and digital interventions on renal outcomes, with a primary focus on albuminuria reduction.

Objective: To evaluate the effect of community-based digital hypertension interventions on renal outcomes, with a focus on albuminuria reduction.

Methods: A systematic search of Scopus, Embase, and ScienceDirect was conducted for studies published from January 2020 onward. Search terms combined telemedicine or digital health interventions with hypertension, adherence, and renal outcomes. The initial search identified 785 records, of which 10 studies met the inclusion criteria. Eligible randomized or comparative studies evaluated digital hypertension-related care versus usual care, with most interventions implemented in community or home-based settings. Risk of bias was assessed using the Cochrane Risk of Bias 2 tool. A random-effects meta-analysis using standardized mean difference (SMD) was performed.

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Results: Ten studies involving 3,819 participants in intervention groups and 3,664 in control groups were included. Digital health interventions were associated with a statistically significant reduction in albuminuria compared with standard care (SMD -0.41 ; 95% CI -0.67 to -0.15 ; $p = 0.002$). Substantial heterogeneity was observed ($I^2 = 94\%$). Overall risk of bias was low to some concerns.

Conclusion: Telemedicine and digital health-based hypertension care, largely delivered in community settings, may reduce albuminuria. Standardized renal outcome reporting and longer-term functional endpoints are needed to strengthen future evidence.

Keywords: telemedicine; digital health intervention; hypertension; albuminuria; chronic kidney disease

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Acupuncture on Vascular Endothelial Function: A Systematic Review of Therapeutic Potential and Safety

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Background: Vascular endothelial is a major factor in the development of cardiovascular diseases, including hypertension. Acupuncture can manage pain and various chronic conditions. It is also an approach for blood pressure control. Pharmacological therapy has been associated with side effects and variable patient responses. This creates a gap in knowledge regarding safe and effective non-pharmacological strategies to enhance treatment outcomes.

Objective: This systematic review aims to evaluate the efficacy and safety of Acupuncture towards vascular endothelial outcomes.

Method: Studies from pubmed, research gate, springers, wiley online library, frontiers, and sage pub were extracted using keywords “acupuncture” and “vascular endothelial” in December 2025. The main outcome is any measure of efficacy in vasodilation and angiogenesis and also the presence of adverse events. Seven randomized controlled trials were included. Animal studies, duplicates, systematic reviews, and meta-analyses were excluded. Study quality was assessed using RoB 2 tools.

Result: There are seven articles (total sample size: 212) with low risk that show an increase in the generation of endothelial nitric oxide and ET-1 additionally angiogenesis. The minimal acupoints required: Bai Hui and Si Shen Cong. One study shows decreased levels of biomarkers (TNF- α and VEGF) in peripheral blood and also other areas and biomarkers related to endothelial decline. One mentioned potential feasibility treatment for grade 1-2 hypertension. No adverse events were reported.

Conclusion: These studies show that acupuncture can increase vasodilation and angiogenesis with no significant side effects. These articles have yet to prove these effects in long term therapeutic applications, requiring further investigations.

Keywords: Acupuncture; Acupoint; Bai Hui; Si Shen Cong

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Upstream Aldosterone Suppression for Uncontrolled and Resistant Hypertension: A Systematic Review and Meta-analysis

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Abstract

Background: Aldosterone excess contributes to difficult-to-control hypertension, yet current therapies primarily target aldosterone signaling at the receptor level. Aldosterone synthase inhibitors directly suppress aldosterone production, but their overall blood pressure-lowering effect across trials remains to be clarified.

Objective: This systematic review and meta-analysis aimed to evaluate the efficacy and safety of aldosterone synthase inhibitors in reducing blood pressure among adults with uncontrolled or resistant hypertension, compared to placebo, across randomized, double-blind, controlled trials.

Methods: We performed a systematic review and meta-analysis of randomized, double-blind, placebo-controlled trials evaluating aldosterone synthase inhibitors in adults with uncontrolled or resistant hypertension. The primary outcome was change in systolic blood pressure. Pooled estimates were calculated using a random-effects generic inverse variance model, with a sensitivity analysis based on arm-level continuous data. Diastolic blood pressure and reported renal and electrolyte outcomes were summarized descriptively.

Results: Six trials with 8–12 weeks of follow-up were included. In the primary analysis, aldosterone synthase inhibitors significantly reduced systolic blood pressure compared with placebo (mean difference -5.83 mmHg, 95% CI -7.66 to -4.00 ; $I^2 = 49\%$). All dose-level estimates favored active treatment, with larger reductions observed at higher

doses. In the sensitivity analysis using continuous data from two large trials, systolic blood pressure reduction was greater (mean difference -9.25 mmHg, 95% CI -11.07 to -7.43 ; $I^2 = 0\%$). Diastolic blood pressure reductions paralleled systolic changes where reported. Hyperkalemia and hyponatremia were infrequent and predominantly mild, and reported declines in estimated glomerular filtration rate were small and transient.

Conclusions: Aldosterone synthase inhibitors provide consistent and clinically meaningful systolic blood pressure reduction in uncontrolled and resistant hypertension, supporting their further clinical development.

Keywords: Aldosterone synthase inhibitors, Uncontrolled hypertension, Baxdrostat, Lorundrostat, Osilodrostat.

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Visit-to-Visit Systolic Blood Pressure Variability and Incidence Of Atrial Fibrillation in Hypertensive Populations: A Systematic Review and Meta-Analysis

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Background: Hypertension is a major risk factor for atrial fibrillation (AF). Beyond mean blood pressure, visit-to-visit systolic blood pressure variability (SBPV) has been linked to worse cardiovascular outcomes and may contribute to atrial remodeling and AF development. However, its association with incident AF in hypertensive populations remains inconsistent and incompletely quantified.

Objective: To evaluate the association between higher visit-to-visit SBPV and the risk of incident atrial fibrillation among adults with hypertension.

Methods: We conducted a PRISMA-guided systematic review and meta-

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analysis of PubMed, Scopus, and ScienceDirect using terms related to visit-to-visit SBPV/BPV, incident/new-onset AF, and hypertension. We included longitudinal cohort studies and post-hoc analyses of randomized trials in adults (≥ 18 years) and excluded studies restricted to prevalent AF at baseline. Adjusted relative effects comparing the highest versus lowest SBPV category were pooled using a random-effects generic inverse-variance model, heterogeneity was assessed with I^2 and explored by sensitivity analyses excluding the largest cohort.

Results: Five studies met eligibility criteria, four contributed to quantitative synthesis (2,112,213 participants). Higher SBPV was associated with increased incident AF risk (pooled relative effect 1.46, 95% CI 1.05–2.03; $p = 0,02$), with substantial heterogeneity ($I^2=85\%$). In sensitivity analysis excluding the largest cohort, heterogeneity decreased markedly ($I^2=20\%$) and the association remained significant (pooled relative effect 1.67, 95% CI 1.34–2.08; $p < 0.00001$), suggesting that differences in population, SBPV definitions, and AF ascertainment contributed to between-study variability.

Conclusion: Higher visit-to-visit SBPV is associated with a higher incidence of AF in hypertensive populations, although the magnitude of the association varies across studies.

Keywords: visit-to-visit systolic blood pressure variability; atrial fibrillation; hypertension; systematic review; meta-analysis

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Ring-Type Photoplethysmography Sensor-Based Blood Pressure Monitoring Devices: A Systematic Review and Meta-Analysis

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Abstract

Background: Conventional BP monitoring, which is typically clinic-based and physician-centered, often fails to capture masked hypertension and the natural circadian or seasonal variations in BP, and is also limited by cost and patient discomfort. Recent advancements in cuffless blood pressure (BP) monitoring have highlighted the potential of ring-type devices, which offer improved comfort, portability, and user adherence compared to conventional cuff-based systems.

Objective: To systematically evaluate the accuracy of ring-type photoplethysmography (PPG)-based cuffless blood pressure monitoring devices by comparing systolic and diastolic blood pressure measurements with reference standards through meta-analysis.

Method: We systematically searched PubMed, ScienceDirect, Scopus, and IEEE Xplore databases for studies assessing the accuracy of ring-type photoplethysmography sensor-based blood pressure monitoring devices. Outcome data included mean difference (MD), standard deviation (SD), and correlation coefficient (r). Pooled mean differences

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(MDs), correlation coefficient (r), and 95% confidence intervals (CIs) were calculated using R 4.5.1.

Result: There are no significant differences between the use of PPG-ring compared to reference measurement for BP monitoring both on SBP (pooled MD: 0.67; 95% CI; -0.34–1.67; $p = 0.19$ [Q: 2.54; $p = 0.64$]) and DBP (pooled MD: 0.44; 95% CI; -0.34–1.21; $p = 0.27$ [Q: 7.52; $p = 0.11$]). Additionally, common-effects meta-analyses on pearson's values showed that, both SBP (pooled r : 0.93; 95% CI; 0.91–0.96; $p < 0.01$ [Q: 3.52; $p = 0.32$]) and DBP, (pooled r : 0.95; 95% CI; 0.93–0.96; $p < 0.01$ [Q: 6.71; $p = 0.08$]) pooled weighted correlation coefficients were interpreted as very high correlation.

Conclusion: Its advanced design represents a major step in BP monitoring, promoting patient self-management with minimal disruption. While cuffless monitors show promise for patient-centered, data-driven care, rigorous validation in standardized and real-world settings is required. Several devices remain in early prototype stages, though the field is rapidly advancing.

Keywords: Accuracy, blood pressure monitoring, photoplethysmography, ring-type

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Association Between Hypertension-related Knowledge, Literacy, and Adherence to Antihypertensive Therapy Among Indonesian Patients: A Systematic Review & Meta-Analysis

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Background: Suboptimal adherence to antihypertensive therapy hinders blood pressure control and increases cardiovascular risk. While patient

knowledge and education are recognized determinants of behavior, evidence from the Indonesian context has not been systematically pooled.

Objective: To assess the relationship between hypertension-related knowledge, health literacy, and medication adherence among Indonesian patients.

Methods: Following PRISMA 2020 guidelines, a systematic search of PubMed, Scopus, and Google Scholar was conducted for studies published up to January 2026. Using the PECO framework, 14 observational and review studies were selected. Quality was assessed using the JBI Critical Appraisal Checklist, and results were synthesized narratively due to study heterogeneity.

Results: Analysis of the 14 included articles revealed a consistent, statistically significant correlation ($p < 0.05$) between higher hypertension-related knowledge, improved health literacy, or structured education and increased medication adherence. Key drivers of adherence included counseling, self-management competence, and healthcare access. While evidence was strong, the risk of bias in cross-sectional studies was generally moderate, primarily due to limited control of confounding variables.

Conclusions: Enhancing patient knowledge and educational exposure consistently improves adherence to antihypertensive therapy in Indonesia. These findings advocate for the integration of structured health education, counseling, and literacy-based interventions into standard hypertension management to optimize clinical outcomes and patient adherence.

Keywords: Hypertension-related Knowledge; Health Literacy; Indonesia; Medication Adherence.

Efficacy and Safety of Sacubitril/Valsartan (LCZ696) versus Olmesartan in Patients with Essential Hypertension: A Systematic Review and Meta-Analysis of RCTs

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Introduction: Sacubitril/Valsartan (LCZ696), a first-in-class Angiotensin Receptor-Neprilysin Inhibitor (ARNI), has demonstrated superior hemodynamic benefits in heart failure. However, its efficacy purely as an antihypertensive agent in patients without compromised cardiac function remains less defined.

Objective: This systematic review and meta-analysis aim to evaluate the efficacy and safety of Sacubitril/Valsartan (SV) compared with standard Angiotensin Receptor Blockers (Olmesartan) in patients with essential hypertension.

Methods: Studies were extracted using electronic databases, such as PubMed, Cochrane Library, and Ebsco on 4 January 2026, using the PRISMA guidelines. Keywords such as "Sacubitril", "Valsartan", "Olmesartan", and "Essential Hypertension" were used to identify the studies. Four independent researchers evaluated the studies, and only Randomized Controlled Trials (RCTs), were included; systematic reviews, meta-analyses, animal studies, and case reports were excluded. Using a fixed-effect model, efficacy will be analyzed from the mean sitting difference from baseline systolic blood pressure (msdbSBP) and diastolic blood pressure (msdbDBP). Safety will be analyzed through the reported adverse effects. Pooled analysis was generated using ReviewManager, and study quality was assessed using the Risk of Bias (RoB 2.0).

Results: A total of seven RCTs ($n = 3,347$) were included in the final analysis. Two studies resulted in low bias while five studies resulted in some concerns. Pooled analysis demonstrated that SV significantly reduced msdbSBP compared to Olmesartan with mean difference -4.13 mmHg; (95% CI: -5.09 to -3.17 ; $p < 0.00001$) with moderate heterogeneity ($I^2 = 42\%$). Similarly, msdbDBP also favored the SV group with mean difference -1.64 mmHg; (95% CI: -2.18 to -1.10 ; $p < 0.00001$) with low heterogeneity ($I^2 = 19\%$). The incidence of adverse events was comparable between the two groups, with nasopharyngitis and dizziness being the most frequently reported events across all studies.

Conclusion: SV demonstrates comparable safety profile and superior efficacy in reducing both msdbSBP and msdbDBP compared to Olmesartan in patients with essential hypertension, suggesting a potent therapeutic option for blood pressure management in patients without heart failure.

Keywords: Sacubitril, Valsartan, Olmesartan, Essential Hypertension

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Clinical Impact of Self-Monitoring Blood Pressure on Hypertensive Disorders of Pregnancy: A Systematic Review and Meta-Analysis

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Background: Hypertensive disorders complicate over 18 million pregnancies worldwide each year and remain a major cause of maternal morbidity and adverse pregnancy outcomes. Delayed detection and inadequate blood pressure control continue to challenge antenatal care. Self-monitoring of blood pressure (SMBP), proven effective in non-pregnant populations, may facilitate earlier detection and improved

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hypertension management during pregnancy. This systematic review and meta analysis evaluates evidence from randomized controlled trials on the impact of SMBP on maternal outcomes.

Objective: To evaluate the clinical impact of self-monitoring blood pressure during pregnancy on severe hypertension, pre-eclampsia, gestational age at delivery, and maternal morbidity compared with usual antenatal care.

Methods: A systematic review and meta-analysis of randomized controlled trials (RCTs) was conducted in accordance with PRISMA guidelines. PubMed, Scopus, ScienceDirect, and Wiley Journals were searched up to 2025. Data were synthesized using random-effects models in RevMan 5.4, and risk of bias was assessed using the Cochrane RoB 2.0 tool.

Results: A pooled analysis of 8 RCTs (n = 6,261) demonstrated that self-monitoring of blood pressure among pregnant women with hypertension reduced the risk of pre-eclampsia (OR 1.5, severe hypertension (OR 0.87; 95% CI 0.69–1.40; p < 0.05), although substantial heterogeneity was observed (I² = 74%). In addition, self-monitoring of blood pressure was associated with a reduction in maternal morbidity (OR 0.49; 95% CI 0.34–0.69). However, no statistically significant differences were observed in gestational age (mean difference 0.10; 95% CI –0.12 to 0.32) or the incidence of pre-eclampsia (OR 1.01; 95% CI 0.80–1.28).

Conclusion: Self-monitoring of blood pressure during pregnancy may serve as a safe and practical adjunct to routine antenatal care in hypertensive women by reducing severe hypertension and maternal morbidity.

Keyword: *pregnancy, hypertension, self-monitoring blood pressure*

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Effect of Bariatric Surgery on Blood Pressure in Adults With Obesity-Related Hypertension: A Systematic Review and Meta-Analysis

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Introduction: Hypertension is a leading global cause of cardiovascular morbidity and mortality, affecting an estimated 1.4 billion adults worldwide and approximately 33 % of individuals aged 30–79 years. Obesity is one of the most important modifiable drivers of hypertension, with 43 % of adults globally classified as overweight and 16 % living with obesity in 2025, corresponding to nearly 890 million adults with obesity worldwide. Bariatric surgery is increasingly used for sustained weight loss and cardiometabolic risk reduction. However, the independent effect of bariatric surgery on blood pressure control in adults with established hypertension remains uncertain, with previous studies reporting heterogeneous findings.

Objective: To evaluate the effect of bariatric surgery compared with nonsurgical management on blood pressure outcomes in adults with obesity and hypertension.

Methods: PRISMA-guided searches of PubMed, Scopus, EBSCO, Epistemonikos, and Cochrane were conducted. Randomized controlled trials were included. Risk of bias was assessed with RoB 2.0, and meta-analysis was performed in R-Studio 4.4.1.

Results: Twenty-seven studies comprising 2,651 participants were included. Bariatric surgery was not associated with a significant

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reduction in systolic blood pressure compared with non- surgical management (MD 1.89 mmHg, 95% CI -4.10–7.89; $p=0.5359$). A modest reduction in diastolic blood pressure was observed (MD -1.71 mmHg, 95% CI -3.17–(-0.25); $p=0.0219$). Secondary outcomes showed lower fasting blood glucose (MD -11.78, 95% CI -22.37–(-1.19); $p=0.0293$) and higher diabetes remission (OR 5.90, 95% CI 1.08–32.38; $p=0.0409$). Adverse events were more frequent after surgery (OR 4.28, 95% CI 1.20–15.33; $p=0.0254$), with no difference in mortality (OR 0.52, 95% CI 0.12–2.18; $p=0.3691$).

Conclusion: Bariatric surgery provides modest diastolic blood pressure reduction without systolic benefit compared with nonsurgical management, alongside metabolic benefits but higher adverse event rates.

Keywords: *Bariatric surgery; Blood pressure; Diastolic blood pressure; Hypertension; Meta- analysis.*

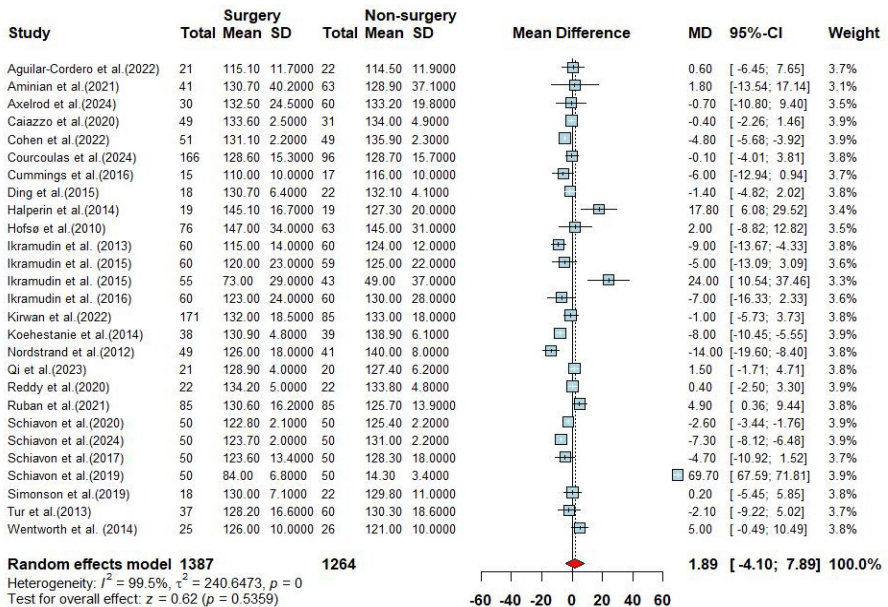


Figure 1. Forest plot of Systolic Blood Pressure (Random effect model)

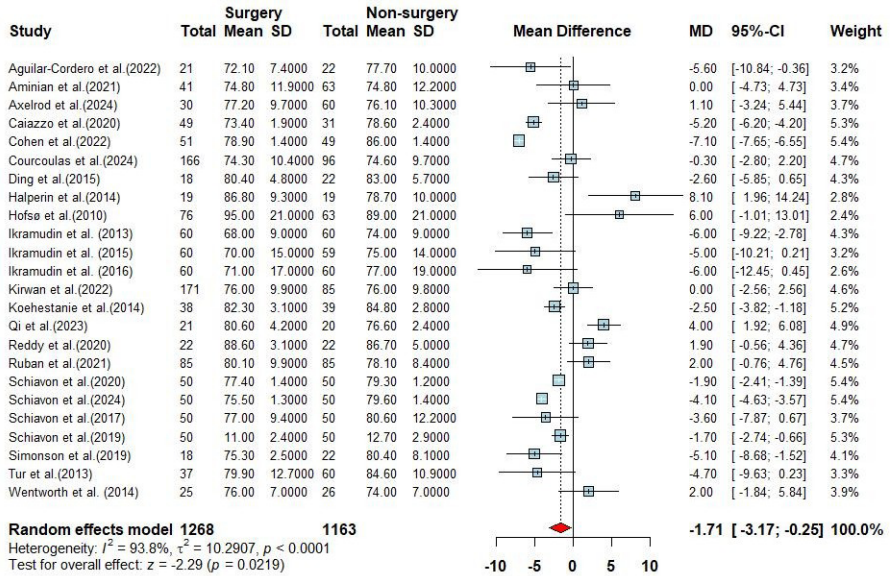


Figure 2. Forest plot of Diastolic Blood Pressure (Random effect model)

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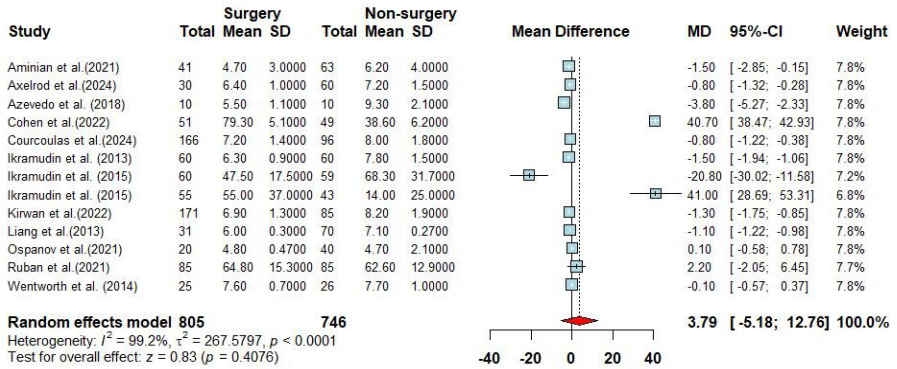


Figure 3. Forest plot of Glycated Haemoglobin (HbA1c) (Random effect model)

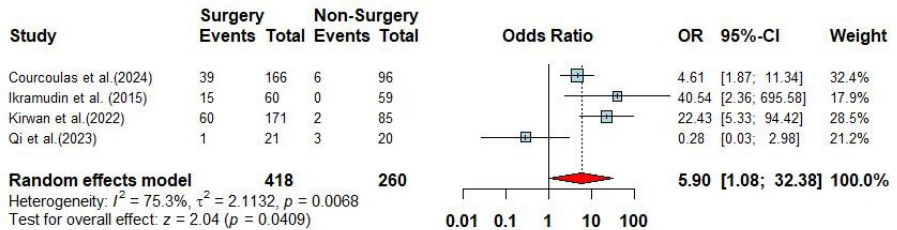


Figure 4. Forest plot of Diabetes Remission (Random effect model)

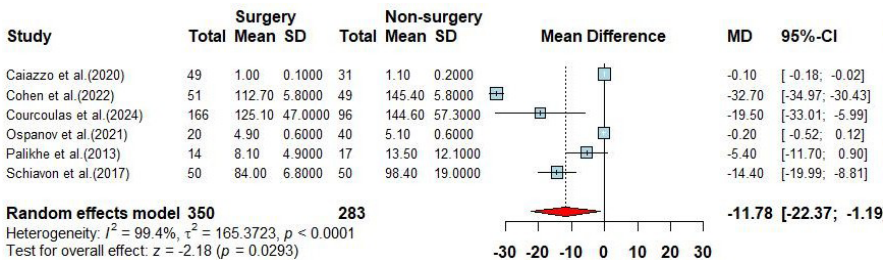


Figure 5. Forest plot of Adverse Events (Random effect model)

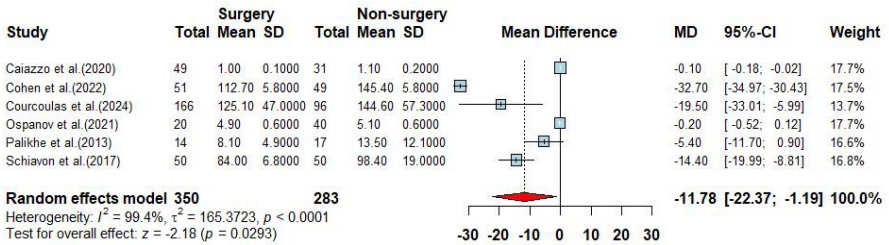


Figure 6. Forest plot of Fasting Blood Sugar (Random effect model)

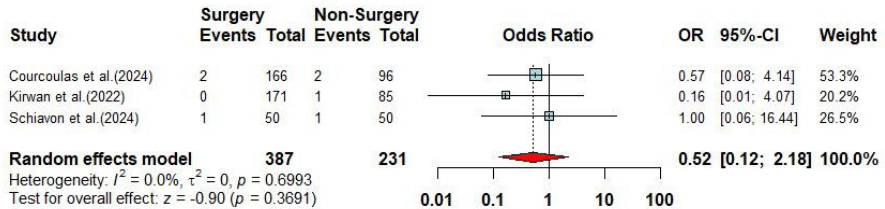


Figure 7. Forest plot of Mortality (Random effect model)

Poster

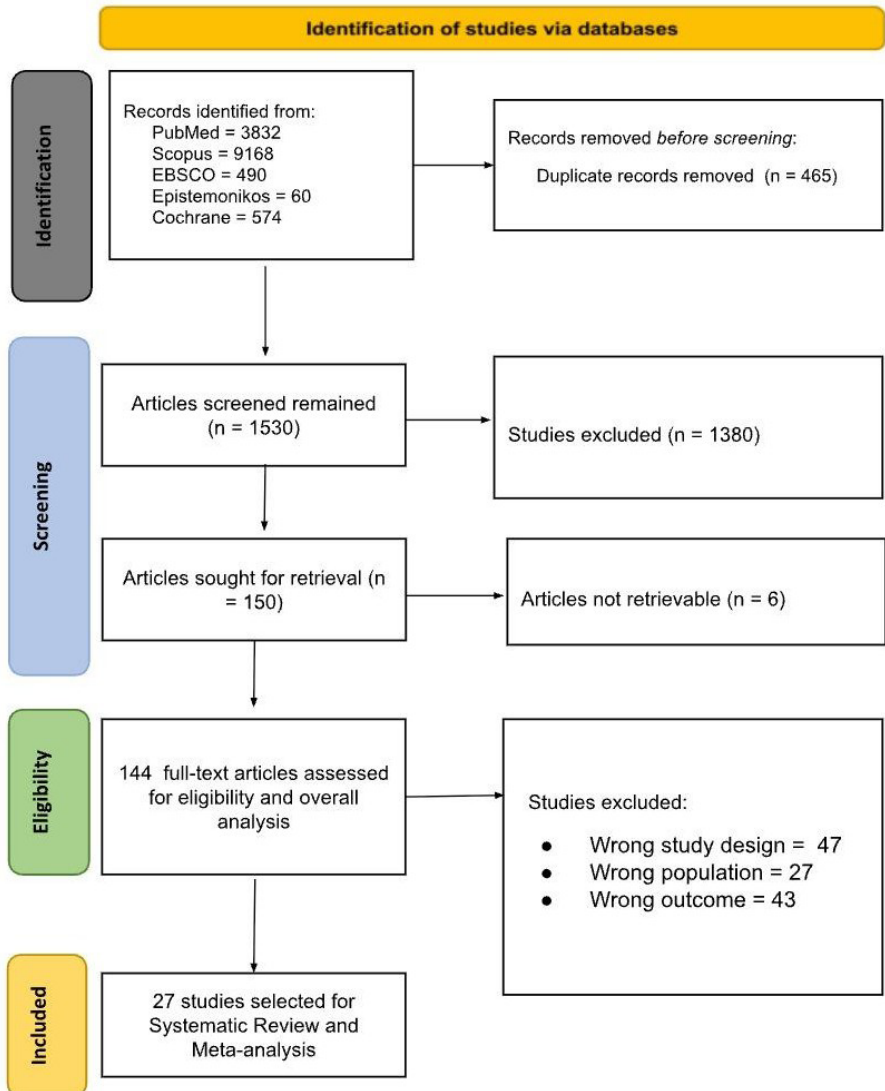


Figure 8. Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) Flowchart of Included Study

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Impact of Hypertension on Post-PCI Mortality and Its Associated Factors: A Systematic Review and Survival Meta-Analysis

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ABSTRACT

Background: Percutaneous coronary intervention (PCI) is a cornerstone procedure performed for patients with coronary artery disease (CAD). Although hypertension is highly prevalent in patients with CAD and has been associated with detrimental outcomes, its prognostic impact on mortality after PCI remains uncertain.

Objectives: This study aims to quantify the overall survival risk and pinpoint the crucial associated factors which influence the prognosis of CAD patients with hypertension after undergoing PCI.

Methods: This systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. Relevant studies were identified through PubMed, ScienceDirect, Proquest, and the Cochrane Library. R studio was used to perform the meta analysis. Data were pooled using a random-effects model to estimate the hazard ratio (HR). Meta-regression was performed to explore causes of variability on the Log Hazard Ratio.

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Results: Eight cohort studies comprising 237,912 patients with CAD undergoing PCI were included. The pooled analysis showed that hypertension was associated with modest but borderline increase in mortality (HR 1.15; 95% CI 1.00 - 1.32). In contrast, a significant association was observed in patients with ST-segment myocardial infarction (STEMI) (HR 1.28; 95% CI 1.06 - 1.55). Survival regression suggested that higher prevalence of impaired postprocedural TIMI flow and multivessel disease were associated as potent predictors of reduced survival.

Conclusion: Compared with the ideal blood pressure, hypertension still increased the risk of mortality following PCI. The risk was highest in patients with STEMI. Impaired reperfusion and complex coronary disease may contribute to heightened risk observed in this population.

Keywords: *PCI, coronary artery disease, ST-segment elevation myocardial infarction, hypertension, mortality*

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Effect of Hypertension on Efficacy of Dual Antiplatelet Therapy in Stroke Patients: A Systematic Review and Meta-Analysis

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Background: Hypertension is a major risk factor for cerebrovascular events and may modify the response to dual antiplatelet therapy (DAPT). DAPT has shown to reduce early recurrent stroke in patients. However, hypertension in patients may modify the response to therapy through its various vascular effects. Evidence remains inconsistent regarding how hypertension influences DAPT efficacy in preventing stroke recurrence.

Objectives: To evaluate the impact of hypertension on DAPT efficacy for secondary prevention in stroke patients.

Methods: A systematic search was conducted across PubMed, Cochrane, Wiley, Taylor and Francis, EBSCO, Epistomonikos, Sage, and SpringerLink for studies published up to January 11, 2026. Three independent reviewers screened studies using Rayyan and assessed quality via the CEBM-Oxford tool. Data extraction focused on recurrent stroke incidence and bleeding events stratified by hypertensive status.

Results: Six studies involving 14,908 patients were analyzed. Hypertensive patients had a significantly higher risk of stroke recurrence compared to those with normal blood pressure (Pooled RR: 1.32, 95% CI: 1.12–1.55, $p = 0.001$; Pooled OR: 1.34, 95% CI: 1.13–1.60, $P=0.0008$). Heterogeneity was low ($I^2=0\%$). Regarding safety, bleeding risk showed no statistically significant difference between groups (Pooled RR: 1.05, $p = 0.69$; Pooled OR: 1.05, $p=0.70$), with very low heterogeneity ($I^2\leq 5\%$).

Conclusion: Hypertension significantly impairs DAPT efficacy, increasing recurrent stroke risk by 32–34% without increasing bleeding complications. To personalize care, clinicians must integrate stroke prevention with systemic cardio-cerebrovascular management. Empowering communities through blood pressure education is essential to bridge the gap between pharmacological intervention and clinical success, ensuring DAPT reaches its full protective potential.

Keyword: Hypertension; stroke; dual anti-platelet therapy

Cost-Effectiveness of Pharmacological and Non-Pharmacological Hypertension Management for Stroke Prevention in East Asia: A Systematic Review

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Introduction: Stroke represents a substantial global economic burden, accounting for approximately 0.66% of the global gross domestic product (GDP). This economic impact is compounded by a rising epidemiological burden, evidenced by increasing trends in stroke incidence, prevalence, mortality, and DALYs.

Objective: This study aimed to assess the cost-effectiveness of hypertension management interventions for the prevention of stroke.

Methods: A systematic search was conducted across PubMed, Scopus, and ScienceDirect to identify economic evaluations of hypertension management for stroke prevention in East Asia. Eligible studies included model-based, trial-based, and observational economic analyses. Quality was assessed using the Consensus on Health Economic Criteria list. Data on costs, quality-adjusted life years, and incremental cost-effectiveness ratios were extracted and synthesized narratively to facilitate cross-study comparison.

Result: Of 1,171 identified records, eight studies satisfied the inclusion criteria, comprising six pharmacological and two non-pharmacological evaluations. Pharmacological strategies included various combination regimens and monotherapy comparisons. Economically, amlodipine monotherapy, amlodipine/benazepril, and ARB/CCB combinations were dominant, exhibiting lower costs and superior efficacy compared to their respective comparators. Meanwhile, enalapril/folic acid and amlodipine/atorvastatin combinations were deemed cost-effective

relative to GDP-based thresholds. Regarding non-pharmacological management, salt substitution was a dominant strategy, whereas the community screening program proved to be cost-saving over a 13-year time horizon.

Conclusion: This review demonstrates that the management of hypertension is a dominant economic strategy in East Asia. The investment in prevention is substantially outweighed by the long-term savings from avoiding costly acute stroke care.

Keyword: Cost-effectiveness; Hypertension; Stroke;

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Serum Uric Acid as an Independent Predictor of Major Adverse Cardiac Events Outcomes in Hypertensive Patients : A Systematic Review and Meta-Analysis

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Abstract

Background: Hypertension is a major driver of major adverse cardiac events. While hyperuricemia is prevalent in hypertensive patients, its role as a direct pathogenic factor versus a metabolic bystander remains debated. Defining the independent prognostic value of serum uric acid (SUA) is essential for enhancing clinical risk stratification.

Objective: To evaluate SUA as an independent predictor of major adverse cardiac events, including myocardial infarction, stroke, and Cardiac death, in patients with hypertension.

Methods: A systematic search was conducted across PubMed, Scopus, Cochrane Library, ScienceDirect, and Google Scholar for

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longitudinal cohorts. Following PRISMA guidelines, eligible studies featured hypertensive populations with SUA and clinical follow-up. Two independent reviewers assessed methodological quality using the ROBINS-I tool, resolving discrepancies via consensus.

Results: We found 2 studies that match our criteria, with a total of 2,302 patients. The pooled analysis showed that higher serum uric acid levels were associated with an increased risk of MACE in hypertensive patients (HR 1.26; 95% CI 1.00 - 1.59). However, substantial heterogeneity was observed among studies ($I^2 = 96\%$).

Conclusions: Serum uric acid may show a consistent association with MACE across studies, but the very high heterogeneity and borderline statistical significance suggest that serum uric acid should be interpreted as a cardiovascular risk marker rather than a definitive causal factor.

Keywords: Serum uric acid, Hypertension, MACE

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Is Renin-Angiotensin System Blockade Enough? Efficacy of Sequential Nephron Blockade in Resistant Hypertension Compared to Renin-Angiotensin System Blockade: A Systematic Review and Meta-Analysis

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Background: Resistant hypertension remains difficult to control despite multiple antihypertensive medications, with approximately 21% of hypertensive patients affected. The comparative effectiveness of sequential nephron blockade (SNB) with diuretics, and renin-angiotensin system blockade (RASB) consisting of ACE inhibitors and β -blockers in reducing systolic blood pressure (SBP) and diastolic blood pressure (DBP) are unestablished, despite being commonly used approaches.

Objective: To evaluate the comparative efficacy of SNB versus RASB in resistant hypertensive patients.

Methods: A comprehensive literature search was conducted across PubMed, Scopus, ProQuest, EBSCO, and ScienceDirect databases for randomized controlled trials of SNB versus RASB on resistant hypertensive patients. The primary outcomes were changes in SBP and DBP. We excluded study protocols, studies involving comorbidities, and those not written in Indonesian or English. The included studies were assessed using The Cochrane RoB 2.0 tool and extracted data were synthesized as mean differences using MetaAnalysisOnline.com.

Result: Meta-analysis was performed on 4 RCTs with a total of 513 resistant hypertensive patients. The follow up in the studies included ranged from 12–20 weeks. SNB showed a higher decrease in SBP by 11.08 mmHg ($p < 0.0001$; 95% CI: -13.97 -8.20; $I^2 = 0.0\%$) and DBP by 4.38 mmHg ($p < 0.0001$; 95% CI: -6.37 -2.39; $I^2 = 0.0\%$) compared to RASB.

Conclusion

SNB is more effective than RASB in resistant hypertensive patients. It is associated with earlier and greater reduction in BP without compromising tolerability. This new regiment is worth being considered in the clinical party.

Keywords: *Resistant hypertension, sequential nephron blockade, renin-angiotensin system blockade, systolic blood pressure, diastolic blood pressure*

Prognostic Role of Thrombocytopenia for Mortality in Pulmonary Hypertension: A Systematic Review and Meta-Analysis

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Background: Thrombocytopenia is frequently observed in patients with pulmonary hypertension (PH) and may reflect advanced disease severity, pulmonary vascular remodeling, or increased platelet consumption. However, the prognostic significance of thrombocytopenia in PH remains unclear.

Objective: This review aimed to evaluate the association between thrombocytopenia and mortality in patients with PH.

Method: Following PRISMA guidelines (PROSPERO CRD420261286940), a comprehensive literature search across five electronic databases was conducted through January 2026. Studies evaluating thrombocytopenia or low platelet count in relation to mortality outcomes in patients with established PH were included. Risk of bias was assessed using the ROBINS-E and PROBAST tools. Where appropriate, pooled hazard ratios (HRs) with 95% confidence intervals (CIs) were calculated using a random-effects model with Review Manager version 5.4.

Result: Six observational studies met the inclusion criteria (N=1,946), all of which evaluated thrombocytopenia as a prognostic factor for mortality in patients with established PH. Across all included studies, thrombocytopenia was consistently associated with increased all-cause mortality. Pooled quantitative analysis demonstrated that thrombocytopenia was associated with a significantly higher risk

of mortality (pooled HR 1.71, 95% CI 1.40–2.10), with no observed heterogeneity ($I^2 = 0\%$).

Conclusion: Thrombocytopenia is associated with increased mortality in patients with PH, supporting the use of platelet count as a prognostic marker in PH and highlighting the importance of platelet abnormalities in disease progression. Further prospective studies are warranted to clarify this association.

Keywords: thrombocytopenia; pulmonary hypertension; mortality; prognosis

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Hemodynamic, Right Ventricular Functions, and Clinical Factors Associated With the Presence of a Precapillary Component in Pulmonary Hypertension Due to Left Heart Disease: A Systematic Review and Meta-Analysis

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ABSTRACT

Background: Pulmonary hypertension due to left heart disease (PH-LHD) is the most prevalent form of pulmonary hypertension, yet its clinical characterization varies widely. The presence of a precapillary component, defined as combined post- and pre-capillary pulmonary hypertension (CpcPH), reflects pulmonary vascular involvement beyond passive congestion and has been associated with worse outcomes. However, factors associated with CpcPH in PH-LHD remain inconsistently reported.

Objectives: To identify hemodynamic, right ventricular functions, and clinical factors distinguishing CpcPH from isolated post-capillary pulmonary hypertension (IpcPH) in PH-LHD.

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Methods: A systematic review and meta-analysis of observational studies was conducted using PubMed and Scopus through December 2025. Adult patients with PH-LHD undergoing right heart catheterization were included. CpcPH and lpcPH were defined using invasive hemodynamic criteria. Random-effects models were applied to pool effect estimates for selected clinical, hemodynamic, and echocardiographic variables.

Results: From 8,562 screened records, 21 studies were included. Compared with lpcPH, CpcPH was consistently associated with reduced cardiac index (SMD -0.53 ; 95% CI -0.75 to -0.31) and worse RV-systolic function, reflected by lower TAPSE (SMD -0.49 ; 95% CI -0.68 to -0.30). Atrial fibrillation was more prevalent in CpcPH but not statistically significant (OR 1.46; 95% CI 0.99–2.16). Secondary analyses suggested impaired RV–pulmonary arterial coupling and lower renal function. Findings were consistent across sensitivity analyses.

Conclusion: Pulmonary hypertension due to left heart disease with a precapillary component constitutes a more advanced and severe phenotype, characterized by impaired hemodynamics and right ventricular dysfunction. The consistent associations with reduced cardiac index, worse right ventricular systolic function, and altered right ventricular–pulmonary arterial coupling support the concept of CpcPH as a distinct and more advanced hemodynamic phenotype within PH-LHD. Comprehensive hemodynamic assessment is essential to support detailed phenotypic characterization and inform clinical evaluation in this population.

Keywords: Pulmonary hypertension; Left heart disease; Precapillary component; Right ventricular dysfunction; Hemodynamics; Cardiac index

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Systemic Inflammation Index Is Associated with Blood Pressure Variability in Adults with Essential Hypertension: A Systematic Review

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ABSTRACT

Background: Blood pressure variability (BPV) is increasingly recognized as an important determinant of cardiovascular morbidity and mortality, independent of mean blood pressure levels. Chronic low-grade inflammation plays a central role in the pathophysiology of hypertension and may contribute to abnormal BPV through endothelial dysfunction, arterial stiffness, and autonomic dysregulation. The systemic inflammation index (SII), derived from neutrophil, lymphocyte, and platelet counts, has emerged as a readily available inflammatory biomarker associated with adverse cardiovascular outcomes. However, its relationship with BPV phenotypes in essential hypertension remains incompletely defined.

Objective: To evaluate the association between systemic inflammation index and blood pressure variability phenotypes in adults with essential hypertension.

Method: A systematic literature search was conducted in PubMed, ScienceDirect, and ResearchGate in accordance with PRISMA 2020 guidelines. Observational studies evaluating the association between SII and BPV in adults with essential hypertension were included. BPV phenotypes were assessed using ambulatory blood pressure monitoring. Study selection, data extraction, and risk of bias assessment were performed through a structured, team-based review process.

Results: Five observational studies met the inclusion criteria. Increased SII demonstrated a moderate association with multiple BPV phenotypes,

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including ambulatory BP variability, non-dipper and reverse-dipper patterns, and exaggerated morning blood pressure surge. Reported correlation coefficients ranged from $r = 0.489$ to 0.619 . Area under the curve values ranged from 0.645 to 0.788 , with sensitivity of 56.4 – 77% and specificity of 57.1 – 84.2% . In multivariable analyses, SII consistently emerged as an independent predictor of adverse BPV patterns and, in some studies, outperformed conventional inflammatory indices.

Conclusion: SII is consistently and moderately associated with BPV in adults with essential hypertension, supporting the role of systemic inflammation in BP instability. Given its low cost and routine availability, SII may represent a clinically relevant tool for early BPV risk stratification.

Keywords: Systemic inflammation index, blood pressure variability, essential hypertension, ambulatory blood pressure monitoring, cardiovascular risk

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Community-Based Personalized Blood Biomarker Monitoring for Heart Failure: A Systematic Review and Meta-Analysis of Hospitalization Outcomes

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ABSTRACT

Background: Heart failure frequently leads to repeated hospitalizations, often from delayed recognition of outpatient decompensation. Community-based personalized monitoring using NT-proBNP, alongside remote physiologic and symptom tracking, may enable earlier

treatment. This systematic review and meta-analysis assessed whether such strategies reduce hospitalization compared with usual care.

Objective: To assess the impact of community-based personalized monitoring on heart failure hospitalizations.

Methods: A systematic search of Scopus, Embase, and ScienceDirect was conducted up to December 2025. From 556 records identified, 10 studies met eligibility criteria. Included studies were randomized or comparative designs enrolling adults with heart failure receiving community-based personalized monitoring, including biomarker-guided and hybrid remote-care models. Study selection followed PRISMA guidelines, and risk of bias was assessed using the Cochrane Risk of Bias 2 tool. Meta-analysis was performed when outcomes were comparable; otherwise, narrative synthesis was applied.

Results: The 10 included studies involved 8,172 participants across community-based monitoring models, including telemonitoring platforms, mobile app-based home monitoring, telerehabilitation, skilled nursing facility programs, and natriuretic peptide-guided strategies. Several studies showed favorable effects on hospitalization burden, including shorter heart failure-related length of stay over 6 months with connected weight telemonitoring compared with standard care (10.7 ± 9.0 vs 14.0 ± 15.4 days). However, results were inconsistent, with minimal or no differences in cumulative hospital days or days alive and not hospitalized.

Conclusion: Community-based personalized monitoring may reduce hospitalization burden in selected heart failure care models, although effects vary across intervention intensity and outcome definitions. Standardization of hospitalization endpoints and biomarker-driven decision protocols is required to strengthen future evidence.

Keywords: heart failure; community-based care; NT-proBNP; telemonitoring; hospitalization outcomes

Shining Light on Hypertension: The Potential of Photobiomodulation (PBM) Therapy as an Adjunctive Treatment

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Background: Hypertension is a major contributor to cardiovascular morbidity and mortality. The application of low-intensity light therapy or photobiomodulation (PBM) is intended to regulate biological processes, including pain modulation, inflammation control, and tissue repair.

Objective: This systematic review and meta-analysis aimed to evaluate the existing evidence on the effects of PBM on blood pressure in hypertensive patients and animal models and to identify knowledge gaps to inform future clinical and experimental research.

Method: A systematic search was performed in accordance with PRISMA guidelines. Randomized controlled trials (RCTs) and experimental animal studies published up to December 2025 that evaluated PBM for hypertension. Clinical and preclinical studies were analyzed separately using descriptive and quantitative methods. The primary outcomes were systolic blood pressure (SBP), diastolic blood pressure (DBP), and nitric oxide levels. Quantitative analyses were conducted using RevMan 5.3.

Results: This systematic review included 4 RCTs and 5 experimental studies involving 229 hypertensive patients and 134 mice, with follow-up periods of up to 12 weeks. In RCTs, PBM significantly reduced SBP compared with control interventions (MD -15.87 mmHg; 95%CI -27.11

to -4.64) and DBP (MD -8.73 mmHg;95%CI -15.19 to -2.26). In experimental studies, meta-analysis of three studies demonstrated a significant reduction in SBP with PBM compared with control therapy (MD -14.44 mmHg;95% CI -18.10 to -10.79). Experimental studies also showed that PBM significantly increased serum nitrite and nitrate (NOx) levels compared with control interventions (MD 12.63;95%CI 2.97 to 22.28).

Conclusion: Photobiomodulation therapy is associated with clinically meaningful reductions in SBP, DBP, and an increase of nitric oxide bioavailability in both patients and experimental models.

Keywords: *Hypertension, Photobiomodulation therapy, Low-level light therapy, Systolic blood pressure, Diastolic blood pressure, Nitric oxide.*

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Perioperative Multimodal Analgesia and Its Impact on Postoperative Pain, Opioid Use, and Hemodynamic Stability: A Systematic Review and Meta-analysis of Randomized Controlled Trials

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Background: Uncontrolled postoperative pain contributes to sympathetic nervous system activation, perioperative blood pressure variability, and increased cardiovascular stress, particularly in patients with hypertension or elevated cardiovascular risk.

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Opioid-based analgesia, while effective for pain relief, may further exacerbate hemodynamic instability and opioid-related adverse effects. Perioperative multimodal analgesia, which combines multiple pharmacological and regional analgesic approaches, has emerged as an opioid-sparing strategy with potential benefits for postoperative pain control and cardiovascular stability. However, evidence from randomized controlled trials remains heterogeneous and requires quantitative synthesis.

Objective: To evaluate the effects of perioperative multimodal analgesia on postoperative pain intensity, opioid consumption, and perioperative hemodynamic stability compared with conventional or opioid-based analgesic regimens in adult surgical patients.

Method: A systematic review and meta-analysis of randomized controlled trials was conducted. Electronic databases were searched for trials comparing perioperative multimodal analgesia with conventional or opioid-based analgesic strategies in adult surgical patients. Continuous outcomes, including postoperative pain scores and opioid consumption, were pooled using standardized mean differences (Hedges g) with 95% confidence intervals. A random-effects model was applied to account for clinical heterogeneity, and statistical heterogeneity was assessed using the I^2 statistic.

Result: Perioperative multimodal analgesia significantly reduced postoperative pain compared with standard analgesic approaches (pooled SMD -0.87 , 95% CI -1.18 to -0.56 ; $p < 0.001$). Opioid consumption was also significantly lower in multimodal analgesia groups (pooled SMD -0.55 , 95% CI -0.80 to -0.30 ; $p < 0.001$). Heterogeneity was moderate for pain outcomes and low for opioid consumption. Several included trials reported improved perioperative hemodynamic profiles, including reduced blood pressure fluctuations and attenuated sympathetic responses.

Conclusion: Perioperative multimodal analgesia improves postoperative pain control and reduces opioid use compared with conventional analgesic strategies. By attenuating pain-related sympathetic activation

and opioid-associated hemodynamic effects, multimodal analgesia may support perioperative blood pressure stability, particularly in patients with hypertension or elevated cardiovascular risk.

Keywords: Multimodal Analgesia; Postoperative Pain; Opioid-Related Disorders; Hemodynamics

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Intracerebral Hemorrhage with Intraventricular Extension in Uncontrolled Hypertension

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Introduction: Hypertension is often asymptomatic and overlooked but can lead to spontaneous intracerebral hemorrhage (ICH), which may extend into the ventricles as intraventricular hemorrhage (IVH) and is associated with high mortality. Hemorrhagic stroke has a 30-day mortality rate of approximately 50%, with half of deaths occurring within the first two days.

Case Illustration: A 62-year-old woman presented to the emergency department with a headache and left-sided limb weakness, approximately 12 hours prior to admission. She had a history of hypertension but did not undergo regular check-ups. On initial examination, her Glasgow Coma Scale (GCS) score was E4V5M6, and her blood pressure was 160/100 mmHg. Neurological examination revealed dysarthria, left central facial palsy, and left hemiparesis. A head CT scan showed an intracerebral hematoma in the right thalamus, along with intraventricular hematomas in the right lateral ventricle, third ventricle, and fourth ventricle.

Discussion: Long-term uncontrolled hypertension in the elderly is a

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major risk factor for arterial rupture leading to ICH. Ventricular extension of hemorrhage is common and associated with a poorer prognosis. In this patient, blood pressure and intracranial pressure control are essential for management.

Result: During treatment, the patient's condition remained stable without neurological deterioration. Conservative therapy with blood pressure and intracranial pressure control yielded favorable clinical outcomes, including improvement in motor function. The patient was subsequently referred to a higher-level healthcare facility in stable condition.

Conclusion: Spontaneous ICH is a potentially fatal complication of hypertension. Optimal blood pressure control and appropriate conservative management play a crucial role in reducing morbidity and mortality.

Keywords: Hypertension; Intracerebral hemorrhage; Intracranial hemorrhage; Intraventricular hemorrhage

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Resistant Hypertensive Emergency with Acute Pulmonary Edema Secondary to Presumptive Iatrogenic Cushing Syndrome: A Case Report

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Introduction: Hypertensive emergency with acute pulmonary edema is a life-threatening condition requiring prompt treatment. When

blood pressure remains resistant to standard therapy, secondary or iatrogenic causes should be considered. Chronic glucocorticoid exposure is a common cause of iatrogenic Cushing syndrome and may contribute to refractory hypertension.

Case illustration: A 69-year-old man presented with progressive dyspnea for one week, accompanied by orthopnea, paroxysmal nocturnal dyspnea, bilateral leg edema, and severe joint pain. He had a history of gouty arthritis and chronic low back pain treated with long term corticosteroids and NSAIDs, uncontrolled hypertension, and type 2 diabetes mellitus. On admission, blood pressure was 220/120 mmHg and oxygen saturation was 87% on room air. Physical examination revealed Cushingoid features, elevated jugular venous pressure, bilateral lung crackles, and pitting edema.

Chest radiography revealed cardiomegaly, pulmonary edema, and elongation of the aorta with atherosclerotic changes. Electrocardiography demonstrated atrial fibrillation with rapid ventricular response, and laboratory findings showed renal dysfunction.

Results: Initial management included intravenous diuretic, continuous intravenous nitroglycerin infusion, and intravenous morphine 2 mg to reduce anxiety and dyspnea. Despite standard therapy with multiple oral antihypertensive agents, blood pressure remained uncontrolled. Repeat clinical reassessment revealed prominent Cushingoid features and a history of long term corticosteroid use for gouty arthritis, raising suspicion for iatrogenic Cushing syndrome. Optimization of pain control and adjustment of corticosteroid therapy resulted in gradual improvement in blood pressure without the need for additional intravenous antihypertensive agents.

Discussion: This case highlights the role of iatrogenic Cushing syndrome and uncontrolled pain as reversible contributors to resistant hypertensive emergency. Recognition of Cushingoid features was essential in guiding management.

Conclusion: Iatrogenic Cushing syndrome should be considered in patients with resistant hypertensive emergencies, particularly in those

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receiving chronic corticosteroid therapy. Careful clinical reassessment and management of reversible contributors may improve outcome and reduce the need for aggressive antihypertensive escalation.

Keywords: Hypertensive emergency; Iatrogenic Cushing syndrome.

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Hypertension emergency, Hypertensive Heart Disease, Intraventricular and Subarachnoid Hemorrhage

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Introduction: Hemorrhagic stroke accounts for approximately 10% to 15% of all strokes; incidence is highest in Asian and low- or middle-income populations. The prevalence of hemorrhage in stroke is 8% to 15% in the United States of America, the United Kingdom, and Australia, and 18% to 24% in Japan and Korea. The incidence is approximately 12% to 15% per 1,000,000 population per year. The incidence is high in low and middle-income countries and Asians, and more common in men and increases with age. The global incidence is increasing, predominantly in African and Asian countries. Japanese data have shown that control of hypertension reduces the incidence of ICH. The case-fatality rate is 25% to 30% in high-income countries and 30% to 48% in low- to middle-income countries. The ICH fatality rate depends on the efficacy of critical care.

Case Illustration: Male, 64y.o admitted in Mohammad Husin Hospital, Palembang with loss of consciousness 6 hours from hospitalization. Projectile Vomiting +7x, convulsion-, headache+. traumacapitis-. Mouth

deviation to the right+. History: Hypertension+.Diabetes-,previous stroke-. Physical examination: GCS:E2M5V2, BP:250/120mmHg, HR90bpm, RR20xbpm, T:36,6C. Barthel index:25, MRS prestroke:0, MRS Recent:4, ICH score: 2(26%mortality), sICH score:1(1,5% of CTA+ for vascular cause) Hemiparesedextra, left lateralisation. quadriparese spastic, NIII: rounded pupil, isochoria, Light reflex+/, 3mm/3mm. parese NVII sinistra, NXII: tongue deviation, disarthia, Pathological reflexes: -/-BCOS/BCOGS.

Hb:8,5G/dL, leucocyte :10.200 c/uL, Trombocyte: 149.000, Ureum/creatinin: 11/0,43 mg/dL, BG:134mg%, albumin: 3,6mg%. Natrium: 148 Meq/L, Kalium: 2,5 MEq/L, Ca: 9,5 Meq/.BGA: PH: 7,321, PCO2 43,6 mmHG, HCO3 22,8 mmol/L, BE: -3,5 mmol/L, lactat 2,7 mmol/L. Ro Thorax: LVH, pneumoniae. CT scan cranial noncontrast: ICH vol 1,4 ml, IVH subarachnoid. Hydrocephalus communicans, susp hemorrhage thalamus dextra. Treatment: ICU, Nicardipin IVdrip for emergency Hypertension, switch to oral Nifedipin 3x10 mg, Candesartan 1x16 mg po, Bisoprolol 1x5 mg po, Furosemid 1x20 mgIV, tranexamic acid 3x500 mg IV, Manitol 250ml then 4x125 ml IV, paracetamol 3x1000 mgIV, Omeprazole 2x40 mgIV, domperidone 3x10 mgpo, Ceftriaxone 2x1 GIV post operation, Nacetyl systein 3x200 mg po, VP shunt emergency. dexmedetomidine continuous IV.KCl 25 Meq+NaCl 0,9 %/8 h.3x, Transfusion PRC 1 kolf,

Result: Consciousness improvement: Compos mentis, BP lowered to 145/76 mmHg in daily monitoring, Hb: 10,6 G/dL, Kalium:5 mEq/L.

Discussion: Brain hemorrhage is the most fatal form of stroke and has the highest morbidity of any stroke subtype. Intraventricular extension of hemorrhage (IVH) is a particularly poor prognostic sign, with expected mortality between 50% and 80%. IVH is a significant and independent contributor to morbidity and mortality, Conventional therapy centers on managing hypertension and intracranial pressure while correcting coagulopathy and avoiding complications such as rebleeding and hydrocephalus. Surgical therapy alone has not changed the natural history of the disease significantly.

Conclusion: Awareness to control Blood Pressure, and early and

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precise, comprehensive treatment for handling complication are vital for patient's prognosis.

Keywords: Hypertension emergency; Hypertensive Heart Disease; Intraventricular; Subarachnoid Hemorrhage.

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Ventricular Septal Rupture as Extreme Complication of Delayed Myocardial Infarction in Elderly Patients with Hypertension and Diabetes: A Case Series

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ABSTRACT

Background: Ventricular septal rupture (VSR) is a rare but fatal complication of myocardial infarction. It is most often seen in late presentation, particularly in elderly patients with cardiometabolic conditions.

Case Illustration: Case 1: A 63-year-old woman with hypertension presented to the hospital four days after chest pain. Angiography showed occlusion of the left anterior descending (LAD), treated with percutaneous coronary intervention (PCI) and stenting. Echocardiography revealed two VSRs (7 mm and 9 mm). Surgical closure was planned.

Case 2: A 74-year-old woman with diabetes presented seven days after chest pain and altered consciousness. Angiography showed occlusion of the LAD, treated with PCI and stenting. Echocardiography identified

a single apicoseptal VSR (7 mm). Transcatheter device closure was planned.

Results: In both cases, PCI provided temporary hemodynamic stabilization despite late presentation. Definitive management strategy was determined by rupture size and morphology, with surgical repair selected for multiple defects and catheter-based closure for a smaller rupture.

Discussion: Chronic hypertension and diabetes may predispose to VSR through increased myocardial wall stress, impaired collateral formation, and atypical symptom presentation, leading to delayed diagnosis and extensive transmural infarction. Cardiogenic shock remains the dominant cause of mortality in post-infarction VSR.

Conclusion: VSR represents an extreme mechanical complication of delayed myocardial infarction in elderly patients with hypertension and diabetes. Better awareness and control of hypertension and diabetes in the elderly may help reduce the extent of presentation and prevent serious complications.

Keywords: *Ventricular septal rupture, percutaneous coronary intervention, hypertension, diabetes mellitus, cardiogenic shock.*

Persistent Uncontrolled Hypertension as a Primary Hemodynamic Driver of Obstructive Chronic Kidney Disease Progression to Uremic Syndrome: A Case Report

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ABSTRACT

Introduction: Hypertension is a major modifiable risk factor for chronic kidney disease (CKD) progression. Sustained uncontrolled blood pressure induces renal vascular remodelling, intraglomerular hypertension, and ischemic nephron loss. In patients with obstructive uropathy, persistent hypertension may act as a dominant hemodynamic stressor that accelerates renal deterioration and precipitates uremic syndrome.

Case Illustration: A 63-year-old man with a decades-long history of poorly controlled hypertension and CKD stage V presented with abdominal pain, nausea, vomiting, anorexia, pruritus, generalized weakness, and decreased urine output. He had a history of irregular antihypertensive medication use and longstanding nephrolithiasis without definitive intervention.

Discussion: Persistent uncontrolled hypertension likely served as the primary driver of renal vascular injury, impairing autoregulation and amplifying the deleterious effects of bilateral urinary obstruction. The combination of chronic hemodynamic stress and obstructive pathology accelerated progression to uremic decompensation.

Results: On admission, blood pressure was 176/96 mmHg, consistent with stage II hypertension. Laboratory findings revealed severe azotemia

with hyperkalemia and hyponatremia, consistent with advanced uremic state. Imaging demonstrated bilateral nephrolithiasis and ureterolithiasis with severe right and moderate left hydronephrosis. The sustained hypertensive state was associated with significant hemodynamic burden and limited renal compensatory capacity. Hemodialysis was initiated, resulting in improvement of uremic symptoms and metabolic abnormalities.

Conclusion: Long-standing uncontrolled hypertension plays a pivotal role in accelerating obstructive CKD progression and triggering uremic syndrome. Early detection and strict blood pressure control are essential to prevent irreversible renal failure.

Keywords: Hypertension; Chronic Kidney Disease; Obstructive Uropathy; Uremic Syndrome; Hemodynamics

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Hemorrhagic Stroke in Pregnancy and Intrauterine Fetal Death in Severe Preeclampsia

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Introduction: Hypertension in pregnancy remains a major cause of maternal and fetal morbidity and mortality. Hemorrhagic stroke is a rare complication of severe preeclampsia, with a reported incidence ranging from 3.5 to 26 cases per 100,000 deliveries. Preeclampsia can also lead to intrauterine fetal death (IUFD).

Case Illustration: A 25-year-old woman, gravida 4 para 3, at 31 weeks of gestation, presented to the emergency department with absent

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fetal movement for two weeks prior to admission. She had a history of hypertension in pregnancy since her first pregnancy and did not attend regular antenatal care (ANC). Her blood pressure on admission was 204/143 mmHg. Neurological examination revealed dysarthria and right-sided hemiparesis. Obstetric ultrasonography confirmed IUFD. A non-contrast computed tomography (CT) scan of the head revealed an intraparenchymal hemorrhage in the left lentiform nucleus.

Discussion: Preeclampsia causes endothelial dysfunction and disruption of the blood-brain barrier, which can lead to hemorrhagic stroke. Impaired uteroplacental perfusion due to preeclampsia can result in IUFD. When hypertension becomes clinically apparent, it increases the risk of IUFD. Monitoring and controlling blood pressure are essential for this patient management.

Result: The patient's condition remained stable after termination of pregnancy. Her blood pressure was closely monitored and controlled in the intensive care unit. She was subsequently referred to a higher-level healthcare facility.

Conclusion: Hypertension is a significant sign of preeclampsia. Severe preeclampsia can lead to serious complications, including hemorrhagic stroke and IUFD. ANC plays a crucial role in prevention of severe preeclampsia complications. Blood pressure monitoring and control were essential in managing this patient.

Keyword: Hemorrhagic Stroke; Fetal Death; Hypertension in Pregnancy; Severe Preeclampsia

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Adrenal Computed Tomography Accuracy in Diagnosing Adrenal Lesion in Primary Aldosteronism: An Evidence Based Case Report

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ABSTRACT

Introduction: A high rate (11,2%) of primary aldosteronism (PA) was observed in a large prospective multicenter study undertaken to diagnose PA in newly referred patients with hypertension (HT). PA implies excess cardiovascular damage and events, and is a common curable cause of hypertension. Adrenal vein sampling (AVS), as the gold standard in differential diagnosis in PA patients willing to undergo adrenalectomy (ADX), is frequently underutilized due to significant technical, logistical, and expertise-related obstacles. In contrast, adrenal computed tomography (CT) is readily available and non-invasive.

Case Illustration: This evidence-based case report (EBCR) is aimed to find the accuracy of adrenal CT compared to AVS in diagnosing adrenal lesion in PA.

Discussion: The search was conducted on PubMed, EBSCOhost, and ScienceDirect according to clinical question. The studies were selected based on inclusion and exclusion criteria and led to 3 useful articles. The selected studies were critically appraised for their validity, importance, and applicability.

Result: Three retrospective studies revealed that adrenal CT accuracy was about 64%. It was found that younger age, plasma aldosterone concentration (PAC) > 30 ng/dL, and unilateral lesion increase adrenal CT accuracy.

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Conclusion: PA patients with younger age, PAC > 30 ng/dL, and unilateral lesion on adrenal CT could be spared AVS.

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Uncontrolled Hypertension Induced STEMI in Young Premenopausal Woman: A Case Report

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Background: Hypertensive emergencies are defined as BP (>180/100 mm Hg) associated with target organ damage, including acute coronary syndrome. ST-segment elevation myocardial infarction (STEMI) in young premenopausal women is relatively rare compared to young men, largely attributed to the cardioprotective effects of estrogen. However, the incidence of STEMI in young women has been increasing, particularly among those with high-risk factors including hypertension, obesity, and diabetes mellitus. Moreover, women often present with atypical symptoms, posing diagnostic challenges that may lead to delayed treatment.

Case Illustration: A 36-year-old woman presented to the emergency department with epigastric pain radiating to the interscapular region for four hours prior to admission. The pain was described as stabbing and pressure-like, with a Visual Analog Scale (VAS) score of 7–8, occurring at rest. She experienced multiple episodes of vomiting and cramping abdominal pain but denied chest pain, diaphoresis, or dyspnea. The patient had a history of uncontrolled hypertension for 5 years. Physical examination revealed elevated blood pressure of 190/100 mmHg, increased jugular venous pressure, and obesity. Electrocardiography demonstrated ST-segment elevation in the anterior lead. Serum troponin was markedly elevated at 20.14 ng/mL. The patient received

initial medical management and prepared for primary percutaneous intervention at PCI-capable hospital.

Conclusion: STEMI rarely occurs in young women. however, this case demonstrates that hypertension can precipitate STEMI even in premenopausal women who expected benefit from the protective effects of estrogen, underscoring the importance of adequate blood pressure control to prevent complications.

Keywords: STEMI, Myocardial Infarction, Uncontrolled Hypertension, Hypertensive Emergency, Young Woman

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Balancing Cerebro-Cardio-Renal Perfusion: Management of Hypertensive Emergency and Pulmonary Edema in CKD Stage V

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Introduction: Hypertensive emergency in CKD stage V requires safe management balancing rapid BP reduction, residual renal function preservation and critical organ perfusion maintenance.

Case Presentation: 49-year-old male came with uncontrolled hypertension presented with progressive dyspnea, and orthopnea. BP 245/161 mmHg, heart rate 109 bpm. Laboratory findings: creatinine 5.9 mg/dL, potassium 3.7 mEq/L, sodium 137 mEq/L. Renal ultrasound showed bilateral parenchymal kidney disease. Chest radiograph demonstrated cardiomegaly with pulmonary edema. Patient was treated

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with intravenous nitroglycerin (NTG) 50 mcg/minute and furosemide 2x40mg. After BP achieve 80% MAP, oral anti hypertension was started with lisinopril 5 mg, lecardipin 20 mg, bisoprolol 2,5 mg

Discussion: NTG was ideal initial therapy because, doesn't reduce GFR, preserves renal perfusion through vasodilation, enables precise BP titration, and no electrolyte disturbances. After BP stabilization, ACE-i initiate because confer kidney protection, reducing kidney replacement therapy risk and anti-remodelling of heart and kidney. First dose monitoring required serum creatinine and potassium checked at 1-2 weeks. ACE-inhibitor discontinuation criteria is serum creatinine rises >30% within 4 weeks of initiation. New-generation CCBs, with vasodilator action on afferent and efferent glomerular arterioles, may have renoprotective effects. Intensive BP control with the target 80% of initial MAP increased cerebral blood flow, contradicting hypoperfusion concerns and prevent reduce residual kidney function. Loop diuretic addressed volume overload causing pulmonary edema.

Result: Patient discharged with BP 140/90 mmHg, creatinine improved from 5.9 to 5.2 mg/dL, and no complications.

Conclusion: CKD-V hypertensive emergency management requires rapid BP control without excessive reduction, renal-perfusion-preserving agents, moderate MAP target and volume management addressing underlying pathophysiology.

Keywords: Hypertensive emergency; chronic kidney disease stage V; ACE-inhibitor; renal perfusion preservation; nitroglycerin

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PHARMACOLOGICAL SABOTAGE IN THE HYPERTHERMIC GERIATRIC PATIENT: A FATAL CASE OF PARADOXICAL HYPERTENSIVE CRISIS IN AN INDONESIAN HAJJ PILGRIM**Muhammad Abdillah Roikhan***Department of Medicine, Airlangga University, Surabaya, Indonesia***ABSTRACT**

Introduction: The 2025 Hajj season in Madinah coincided with a severe heatwave, recording temperatures exceeding 44°C. While heat stroke typically manifests as cardiovascular collapse (hypotension), a distinct subset of geriatric patients presents with paradoxical hypertensive emergencies. This report analyzes the fatal trajectory of a 73-year-old Indonesian pilgrim from Surabaya, proposing "Pharmacological Sabotage" as the mechanism where antihypertensive therapy dismantled homeostatic thermoregulation.

Case Illustration: Mr. S, a pilgrim from the Surabaya Embarkation with a history of Stage 2 Hypertension, arrived in Madinah on May 8, 2025. Following nine days of acclimatization and religious activity (Arbain) in extreme dry heat, he suffered a sudden collapse on May 17, 2025. Unlike typical heat syncope, the subject presented to the Madinah Cardiac Center with Hypertensive Crisis rather than shock. Despite emergency stabilization efforts, the patient expired at 21:30 WAS due to cardiac arrest precipitated by hemodynamic overload.

Discussion: This case suggests a fatal interaction between environmental hyperthermia and the patient's medication regimen with three mechanisms of failure: (1) ACE inhibitors blunted dipsogenic signaling at the Subfornical Organ causing voluntary dehydration; (2) Beta-blockade prevented compensatory tachycardia for cooling; (3) Heat-induced sympathetic storm, in the presence of beta-blockade, resulted in unopposed alpha-adrenergic vasoconstriction, causing a paradoxical hypertensive crisis.

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Result: The mortality was driven by a drug-environment mismatch where cardioprotective medications became agents of thermoregulatory failure.

Conclusion: Managing hypertension in hyper-arid environments requires a paradigm shift. Clinicians must recognize that hyperthermic patients presenting with high blood pressure are likely victims of pharmacological alpha-unmasking, requiring immediate cooling rather than aggressive pressors.

Keywords: ACE Inhibitor; Beta-Blocker; Heat Stroke; Hypertensive Crisis; Thermoregulatory Failure

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Postpartum Eclampsia Complicated by Concurrent Thyroid Storm in a Preterm Mother: A Case Report

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Introduction: Eclampsia, a hypertensive disorder that life threatening complication. thyroid storm is a rare endocrine emergency, due to contribute high maternal - fetal mortality and morbidity. a prevalence of hyperthyroidism in pregnancy about 0.5-2/1000 pregnancies. Failure to diagnose and control hyperthyroidism before or during pregnancy substantially increases the risk of adverse maternal and fetal outcomes.

Case Presentation: A 25-year-old woman, with G3P1A1, at 32+4 weeks of gestation presented with preterm labor with severe Preeclampsia

(217/114 mmHg). She had no prior history of thyroid disease and was initially managed as severe preeclampsia followed by emergency vaginal delivery. Postpartum, the patient developed acute dyspnea, palpitations, seizures twice, and progressive deterioration of consciousness. Laboratory evaluation showed hemoglobin 13.4 g/dL, leukocyte count $13.2 \times 10^3/\mu\text{L}$, platelet count $269 \times 10^3/\mu\text{L}$, TSH <0.005 mIU/L, and markedly elevated free thyroxine (FT4 49.7 pmol/L). Imaging revealed cardiomegaly with pulmonary edema, bilateral pneumonia, and cerebral edema. The patient was admitted to the intensive care unit; however, despite aggressive management, she deteriorated and died after five days of ICU.

Discussion: Hyperthyroidism represents a major contributor to maternal morbidity during pregnancy and is also associated with adverse fetal outcomes. Its clinical presentation often overlaps with hypertensive disorders of pregnancy, particularly severe preeclampsia and eclampsia. Maternal morbidity included a high incidence of toxemia, premature delivery, placental abruption, thyroid crisis and congestive heart failure. Although hyperthyroidism rarely develops in early pregnancy, its signs and symptoms remain clinically important.

Result: Based on physical examination and laboratory findings, the patient was diagnosed with P2A1, decreased level of consciousness caused by thyroid storm, eclampsia, respiratory failure caused by pulmonary edema, bilateral pneumonia, and cerebral edema.

Conclusion: Eclampsia with concurrent thyroid storm is a rare complication in postpartum, but leading the causes of mortality and morbidity in maternal and fetal. Early recognition and effective management are vital in preventing adverse maternal and fetal outcomes.

Keyword: Hypertensive disorder of pregnancy; preeclampsia; eclampsia; Hyperthyroidism; thyroid storm

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Hypertensive Emergency in Patients with CKD on Regular Hemodialysis with Acute Pulmonary Oedem

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Background: Patients with CKD who undergo regular hemodialysis are at high risk of developing hypertensive emergency. This condition arises from fluid overload, activation of the renin-angiotensin-aldosterone system, increased activity of sympathetic nervous system, non-adherence to dietary sodium, fluid restrictions and antihypertensive therapy. This condition can exacerbate cardiovascular and neurological dysfunction and associated with increased morbidity and mortality.

Case Illustration: A 39-year-old man presented with dyspnea and generalized weakness. with CKD on HD twice-weekly for one year. Blood pressure was 225/125 mmHg, heart rate 109 beats/min, respiratory rate 24 breaths/min. Physical examination showed elevated jugular venous pressure, laterally displaced apical impulse, systolic murmur, bilateral basal crackles, and pretibial edema. Chest X-ray revealed cardiomegaly with pulmonary congestion and bilateral pleural effusion. Electrocardiography showed left ventricular hypertrophy and echocardiography hypertensive heart disease with preserved systolic function. Laboratory results showed hemoglobin 6.7 g/dL, urea 143 mg/dL, creatinine 19.16 mg/dL, and potassium 4,8 mEq/L, sodium 148 mEq/L. Kidney ultrasound was contracted kidneys bilateral.

Discussion: Hypertensive emergency with acute pulmonary oedema in HD patients is predominantly volume-dependent and often associated with chronic hypertension, left ventricular hypertrophy. Controlled blood pressure reduction combined with optimal volume management

is crucial to alleviate pulmonary congestion and prevent further target organ damage.

Result: After the initiation of treatment, including fluid and sodium restriction, negative fluid balance through optimized HD, intravenous nitroglycerin, intravenous furosemide, oral antihypertensive agents, and packed red cell transfusion during HD, the patient showed clinical improvement.

Conclusion: Hypertensive emergency in CKD patients on regular HD is a life-threatening condition. Early recognition, effective volume control and individualized management are essential to improve clinical outcomes.

Keywords: Hypertensive Emergency; CKD on regular HD; Pulmonary oedema.

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Hypertensive Emergencies in Patients with Cardiovascular and Renal Multimorbidity

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Abstract

Introduction: Hypertensive emergency is a medical emergency characterized by acute elevations in blood pressure accompanied by target organ damage. This condition is often found in patients with chronic kidney disease, especially those undergoing regular hemodialysis, and exacerbated by cardiovascular and metabolic comorbidities.

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Case: A 56-year old man presented with complaints shortness of breath. He had been routine HD for the past 1 year, twice weekly. History of type 2 diabetes mellitus and CAD. Physical examination blood pressure was 233/106 mmHg, heart rate is 120 beats/min, respiratory rate 26 breaths/min, temperature 36.5°C, SpO2 97% with NRM 15 l/minutes. JVP was (5+2) mmH2O, bilateral basal crackles (+), pretibial edema (+). CT urology moderate right hydronephrosis with nephrolithiasis, thorax x-ray cardiomegaly with pulmonary congestive. electrocardiogram Left Ventricle Hypertrophy, echocardiography HHD preserved LV function, CAG calcified 45% in LAD, laboratory hemoglobin 8.7g/dl, ureum 192mg/dl, creatinine 14.58mg/dl, random blood glucose 166mg/dl, potassium 4.7mEq/l. Non-pharmacological therapy dietary protein 1.2 g/kgBB/day, low salt <2 g/day. Pharmacological therapy drip nitroglycerin, furosemide 2x2amp iv, candesartan 1x16mg, nifedipine 3x10mg, clonidine 3x0.15mg, aspilet 1x80 mg, prandial insulin 3x8iu. Patient had right DJ stent inserted.

Discussion : The patient was given intravenous nitroglycerin due to elevated blood pressure >180/120 mmHg and pulmonary edema, leading to a diagnosis of hypertensive emergency. Nitroglycerin was chosen due to the patient's comorbid pulmonary edema. Nitroglycerin administration is estimated to improve symptoms by 15% within the first 2 hours.

Result : The patient experienced gradual improvement in blood pressure within 2 hours, with a MAP decrease from 148 to 108 (29%). Furthermore, the patient also experienced improvement in shortness of breath.

Conclusion: Management was multidisciplinary, with gradual blood pressure reduction using intravenous antihypertensives, volume management through hemodialysis, and optimization of therapy for coronary heart disease and diabetes mellitus. This case highlights the complexity of managing hypertensive emergencies in patients with multimorbidity.

Keywords: hypertensive emergency, chronic kidney disease, coronary artery disease, nephrolithiasis, type 2 diabetes mellitus.

PD-157

The Deadly Triad: Severe Preeclampsia, HELLP Syndrome, and Pulmonary Embolism — A Case Report with Pathophysiological Perspectives

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Abstract

Background: HELLP syndrome is a severe form of preeclampsia that occurs in less than 1% of pregnancies but can lead to death. HELLP syndrome is part of the thrombotic microangiopathy (TMA) spectrum. One of the most fatal complications is pulmonary embolism.

Case Illustration: A 34-year-old woman, G2P1001, with gestational age 32-33 weeks, presented with hypertensive emergency and superimposed preeclampsia with severe features. Blood pressure was 233/160 mmHg, with gross hematuria and proteinuria +4. During initial therapy, she complaints of headache and decreased fetal movement, then an emergency cesarean section was performed. She was diagnosed with P1102 post-cesarean section, superimposed preeclampsia with severe features, HELLP syndrome class III and gross hematuria. Laboratory examinations showed leukocytopenia, thrombocytopenia, elevated AST, ALT, and LDH. Echocardiography showed concentric LVH, EF 67%, diastolic dysfunction, and pericardial effusion. Patient's

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condition deteriorated abruptly, beginning with sudden desaturation, hypotension, and tachycardia, and progressing to cardiac arrest.

Discussion: Pregnancy is a hypercoagulable state, and the presence of preeclampsia and HELLP syndrome can exacerbate inflammatory response and coagulation activation resulting further damage to vascular endothelial cells and lead to TMA. This increases the risk of VTE complications (DVT and pulmonary embolism). Thromboprophylaxis can be considered to reduce the risk of VTE.

Conclusion: Preeclampsia complicated by HELLP syndrome or VTE carries a high risk of mortality and morbidity, and management approaches are challenging due to the limited research and trials involving these patients. In this case, A thorough examination, rapid and accurate diagnosis, and a comprehensive therapeutic management approach are essential.

Key Word: Preeclampsia, HELLP syndrome, pulmonary embolism.

PD-158

A Young Hospital Worker with Hypertension and Kidney Injury

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Introduction: Hypertension frequently accompanies acute glomerulonephritis, yet atypical immunological patterns may complicate diagnosis and management. We report a case of post-infectious glomerulonephritis (PIGN) presenting with hypertension (170/100 mmHg) and acute kidney injury, notable for unusual immunofluorescence patterns mimicking other glomerulonephritis.

Case Presentation: A 33-year-old male presented with hypertension, fever, macroscopic hematuria, and foamy urine following recurrent upper respiratory tract infections (URTI) from occupational healthcare exposure. Laboratory findings revealed elevated serum creatinine, macroscopic hematuria, proteinuria (ACR 80 mg/g), and elevated anti-streptolysin O titer. Notably, complement levels were normal, Anti-nuclear antibody and serologies were negative.

Result: Prompt blood pressure management with angiotensin-converting enzyme inhibitor and calcium channel blocker was initiated during hospitalization. Renal biopsy revealed mesangial-matrix proliferation, endocapillary hypercellularity, fibrocellular crescents, and inflammatory infiltrates. Remarkably, immunofluorescence demonstrated atypical

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Immunoglobulin (Ig) M and IgA positivity with negative IgG, C3, and C1q—an atypical pattern for PIGN.

Discussion: This case illustrates several unusual features: IgM/IgA-dominant pattern without C3 positivity, suggesting alternative complement pathway involvement; normal complement levels contrasting typical hypocomplementemia; occupational healthcare exposure as a potential risk factor for recurrent antigenic stimulation. The fibrocellular crescents indicated aggressive disease correlating with persistent proteinuria and hematuria. Despite controversial corticosteroid suggestions from other studies in patients with crescentic lesions, conservative management resulted in gradual improvement.

Conclusion: This case emphasizes recognizing atypical PIGN variants in younger adults with recurrent URTI and occupational exposure with resolution from prompt conservative management. Long-term follow-up is essential to monitor for chronic kidney disease progression.

Keywords: *Hypertension; hematuria; acute kidney injury; post-infectious glomerulonephritis; occupational exposure.*

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Management of Intradialytic Hypertension in Pregnant Woman on Maintenance Hemodialysis: Case Report

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Abstract

Background: Pregnant women on maintenance hemodialysis (MHD) often experience uncontrolled blood pressure (BP). When BP rises during dialysis, it is called intradialytic hypertension (IDH). The guidelines remain scarce in this population.

Case illustration: 41 year-old woman had been on MHD for 2 years. She had chronic hypertension, treated with amlodipine 1x10 mg and candesartan 1x16mg. Since pregnant, antihypertensive agents were changed to metildopa 3x250 mg and nifedipine ER 1x30 mg. During dialysis, her BP often increased to 150/90-170/95 mmHg. Management included increasing nifedipine ER dose to 60 mg and adding 10 mg nifedipine if intradialytic BP remained high. Dialysis frequency was increased to 3x/week (12-15 hours/week). Fluid (maximum 1000 cc/day) and salt restriction (<2 grams/day) were implemented.

Discussion: Key IDH strategies in this patient included fluid/sodium restriction, use of non-dialyzable and pregnancy-safe antihypertensive agents, limiting interdialytic weight gain (IDWG) to 4-4.5% of dry weight, and intensified hemodialysis. In pregnant dialysis patients, dry weight requires adjustment, with an expected increase of 0.5 kg/week in the second and third trimesters. Ideally, increasing dialysis duration to at least 20 hours/week can further reduce IDH risk, but only 15 hours/week were feasible in our centre. Since metildopa was dialyzable, we

Poster

gave oral nifedipine ER 60 mg before dialysis and an extra oral nifedipine 10 mg if IDH still occurred.

Result: Following these interventions, the average intradialytic BP decreased to 120/70-130/80 mmHg, and BUN stabilized below 50 mg/dL.

Conclusion: Fluid/salt restriction, limiting IDWG, intensified hemodialysis, and pregnancy-safe antihypertensive agents can effectively control IDH in pregnant dialysis patients.

Keywords: intradialytic hypertension; hypertension; hemodialysis; pregnant; IDWG

PD-160

Minimal Change Disease Manifestations of Relapsing Nephrotic Syndrome, Iatrogenic Cushing Syndrome, Secondary Polycythemia and Hypertension

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Abstract

Introduction: Minimal Change Disease (MCD) is a common cause of nephrotic syndrome in children and adults. Corticosteroid therapy is the

first line of treatment but can cause complications such as iatrogenic Cushing syndrome and secondary polycythemia, as observed in this case. This report aims to highlight the complexity of MCD management and the importance of multidisciplinary care.

Case Illustration: A 19-year-old male with a history of MCD presented with relapsing nephrotic syndrome after prolonged corticosteroid use. The patient experienced generalized edema and proteinuria. He also developed iatrogenic Cushing syndrome with features such as central obesity, moon face, and striae. Laboratory investigations revealed secondary polycythemia with elevated hemoglobin and hematocrit levels. A kidney biopsy confirmed MCD.

Discussion: The patient was treated with high-dose methylprednisolone, followed by tapering. However, a relapse occurred, requiring careful monitoring of corticosteroid therapy and consideration of alternative immunosuppressants like cyclosporine. The secondary polycythemia was managed with phlebotomy and low-dose aspirin to reduce hematocrit and prevent thrombosis, and also hypertension was managed with anti hypertension. Non-pharmacological interventions, including fluid restriction, a low-sodium diet, and daily weight monitoring, were also important in managing the patient's edema.

Conclusion: This case illustrates the complexity of managing MCD with relapsing nephrotic syndrome and highlights the need for individualized, interdisciplinary treatment strategies to prevent complications such as Cushing syndrome, polycythemia, and hypertension

Keywords: *Minimal Change Disease, Nephrotic Syndrome, Iatrogenic Cushing Syndrome, Secondary Polycythemia, Hypertension.*

Obstructive Sleep Apnea in Hypertension

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Background: Hypertension is diagnosed when the blood pressure in office $\geq 140/90$ mmHg. Obstructive sleep apnea (OSA) is characterized by episodes of repetitive complete or partial collapse of the upper airway with oxygen desaturation or sleep disorders. OSA is frequently overseen in hypertensive patients. Study from Logan et al showed around 40-50% of hypertensive patients accompanied by OSA, which often undiagnosed and untreated.

Case Report: This is a case of a 57 years-old male with hypertension on treatment (Nebivolol, Telmisartan and Amlodipine). He is diabetic and overweight (BMI 26 kg/m²). To evaluate the treatment response, a 24-h ambulatory blood pressure monitoring (ABPM) was done. The overall Systolic/Diastolic blood pressure (SBP/DBP) average was 127/74 mmHg. SBP/DBP average during Morning and during the Day were 126/76 mmHg and 127/73 mmHg, respectively. However, at night (21:30-04:00) the SBP/DBP average was 128/75 mmHg showing a Non-dipper hypertension. One of the causes is sleep apnea.

A thorough history taking revealed snoring during sleep without dyspnea. The patient reported waking up quite fresh in the morning without sleepiness during daytime. Sleep test showed an Apnea-Hypopnea Index of 81.6 events per hour, indicates severe obstructive sleep apnea. The patient was prescribed a positive airway pressure machines and lifestyle changes.

Discussion: This case highlights the importance of ABPM in detecting abnormalities during sleep and hence helping in diagnosing OSA. History taking is important and although asymptomatic, OSA is still possible.

OSA is frequently overseen in hypertensive patients leading to chronic disease burden with multiple complications.

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Accelerated Hypertension Mimicking COPD Exacerbation: A Case of Acute Decompensated Heart Failure with Type 2 Respiratory Failure

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Introduction : Acute dyspnea in patients with chronic obstructive pulmonary disease (COPD) is commonly attributed to pulmonary exacerbation¹. However, accelerated hypertension may precipitate acute decompensated heart failure (ADHF), presenting with overlapping respiratory manifestations and posing a diagnostic challenge^{2,3}.

Case Illustration : A 66-year-old woman with hypertension and COPD, routinely followed at a pulmonary clinic and treated with fluticasone-salmeterol, salbutamol, and amlodipine, presented with worsening dyspnea for five hours. She reported dyspnea on exertion and orthopnea without fever or chest pain. Blood pressure on admission was 182/107 mmHg. Chest radiography revealed cardiomegaly (CTR 0.68), aortic knob calcification, increased bronchovascular markings with cephalization, and early pulmonary edema. Arterial blood gas analysis showed severe respiratory acidosis (pH 7.15, PaCO₂ 123 mmHg, HCO₃⁻ 56.7 mmol/L). The clinical course was complicated by refractory type 2 respiratory failure requiring tracheostomy and mechanical ventilation, focal seizure, and severe acidosis. The final diagnosis was ADHF with a wet-and-warm hemodynamic profile precipitated by accelerated

Poster

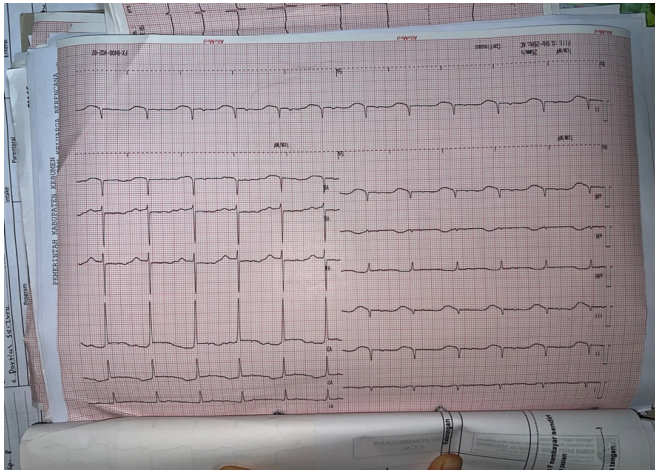
hypertension due to hypertensive heart disease, with concomitant improving COPD exacerbation.

Discussion : Radiographic evidence of pulmonary congestion and cardiomegaly, together with severe hypercapnia disproportionate to inflammatory markers, supported a cardiogenic mechanism of respiratory failure^{4,5}. Hematologic findings showed anemia without leukocytosis, while Gram staining revealed mixed organisms without clinical sepsis, suggesting colonization rather than primary infection⁶. These findings indicate that accelerated hypertension triggered multisystem deterioration, affecting respiratory, neurologic, and acid-base balance, despite stable underlying COPD^{7,8}.

Result : Targeted management focusing on blood pressure control, heart failure therapy, and respiratory support led to clinical improvement^{4,5}. Hypercapnia and respiratory acidosis resolved, hemodynamics stabilized, and pulmonary congestion decreased. COPD symptoms improved with standard bronchodilator therapy¹.

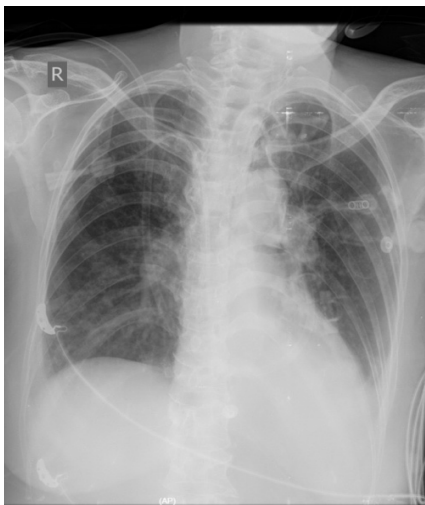
Conclusion : Accelerated hypertension should be considered a key cause of acute dyspnea and type 2 respiratory failure in COPD patients. Early recognition of hypertensive-driven ADHF is crucial to guide appropriate management and improve outcomes.

Keyword : Accelerated hypertension; Acute decompensated heart failure; Type 2 respiratory failure; COPD; Hypertensive heart disease



Picture 1. ECG showing LVH with strain pattern

Twelve-lead electrocardiogram demonstrating sinus rhythm with increased QRS voltage in lateral precordial leads (V4-V6) and deep S waves in V1-V2, consistent with left ventricular hypertrophy, accompanied by secondary ST-T depression and T-wave inversion, without acute ischemic changes.



Picture 2. Chest Radiograph Demonstrating Cardiomegaly and Early Pulmonary Edema

Supine anteroposterior chest radiograph showing cardiomegaly (CTRO.68), aortic knob calcification, increased bronchovascular markings with cephalization, and early pulmonary edema, consistent with hypertensive heart disease.

Poster

Referensi

1. GOLD (2024) Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. Global Initiative for Chronic Obstructive Lung Disease.
2. Mannino, D.M. and Thorn, D. (2015) 'Chronic obstructive pulmonary disease and cardiovascular disease: a systematic review', *International Journal of Chronic Obstructive Pulmonary Disease*, 10, pp. 231–239.
3. Rutten, F.H., Cramer, M.J., Grobbee, D.E., et al. (2016) 'Unrecognized heart failure in elderly patients with stable chronic obstructive pulmonary disease', *European Heart Journal*, 37(11), pp. 929–936.
4. McDonagh, T.A., Metra, M., Adamo, M., et al. (2023) '2023 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure', *European Heart Journal*, 44(4), pp. 359–372.
5. Masip, J., Peacock, W.F., Price, S., et al. (2018) 'Indications and practical approach to non-invasive ventilation in acute heart failure', *European Heart Journal: Acute Cardiovascular Care*, 7(5), pp. 421–429.
6. Miravittles, M., Soler-Cataluña, J.J., Calle, M., et al. (2017) 'Spanish COPD guidelines (GesEPOC) 2017: pharmacological treatment of stable COPD', *Archivos de Bronconeumología*, 53(6), pp. 324–335.
7. Williams, B., Mancia, G., Spiering, W., et al. (2018) '2018 ESC/ESH Guidelines for the management of arterial hypertension', *European Heart Journal*, 39(33), pp. 3021–3104.
8. Smith, W.S. and Fisher, M. (2019) 'Cerebrovascular effects of acute hypercapnia and systemic acidosis', *Stroke*, 50(5), pp. e121–e124.

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Stage 2 Hypertension and Metabolic Syndrome in Buerger's Disease: A Clinical Challenge

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Background: Buerger's disease (Thromboangiitis Obliterans) is a non-atherosclerotic inflammatory vasculitis primarily affecting young male smokers. When coexisting with Stage II Hypertension and uncontrolled diabetes mellitus, it significantly complicates vascular management and elevates the risk of limb loss.

Case Illustration: A 46-year-old male heavy smoker presented with chronic limb-threatening ischemia, characterized by rest pain and necrotic ulcers on his left toes. Physical examination revealed Stage II Hypertension (160/100 mmHg), overweight (BMI 27.8 kg/m²), and absent pedal pulses. Laboratory findings confirmed uncontrolled Type 2 Diabetes Mellitus (HbA1c 8.9%) and dyslipidemia. Digital subtraction angiography confirmed segmental arterial occlusion with pathognomonic "corkscrew" collaterals.

Discussion: Hypertension and hyperglycemia act as synergistic "double-hit" factors, worsening peripheral perfusion and impairing wound healing in Buerger's disease. Integrated management focusing

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on hemodynamic stability using ACE-inhibitors and Calcium Channel Blockers, alongside tight glycemetic control, is essential for limb salvage.

Results: The patient presented with necrotic ulcers and rest pain in his left toes. Physical examination revealed Stage II Hypertension (160/100 mmHg), overweight (BMI 27.8 kg/m²), and absent pedal pulses. Investigations confirmed uncontrolled Type 2 Diabetes Mellitus (HbA1c 8.9%), dyslipidemia, and segmental arterial occlusion consistent with Buerger's disease. Management focused on strict smoking cessation, anticoagulation with heparin, and aggressive blood pressure control using ACE inhibitors and Calcium Channel Blockers. Glycemic control was optimized with insulin therapy. Over a 14-day hospitalization, the patient showed significant reduction in rest pain, stabilized blood pressure, and improvement in wound granulation without the need for immediate major amputation.

Conclusion: Managing Buerger's disease in the presence of hypertension and metabolic syndrome requires a comprehensive approach. Aggressive control of blood pressure and glucose, alongside absolute smoking cessation, is pivotal in improving peripheral perfusion and preventing disease progression in high-risk vascular patients.

Keywords: Buerger's disease; chronic limb-threatening ischemia; hypertension; metabolic syndrome; smoking cessation

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Challenges in Initiating Guideline-Directed Therapy (GDMT) in Elderly Post-Cardiogenic Shock with Persistent Hypotension: A Case Report from a Resource-Limited Setting

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Introduction: Cardiogenic shock (CS) is the most severe manifestation of heart failure and is associated with high mortality despite invasive therapy. In-hospital initiation of Guideline-Directed Medical Therapy (GDMT) improves outcomes, yet hypotension frequently delays treatment, particularly in resource-limited settings. This case highlights the importance of individualized decision-making in initiating GDMT despite persistent hypotension.

Case Illustration: A 67-year-old man presented with chest pain, dyspnea, and palpitations after discontinuing heart failure medications for ten days. He was hypotensive, tachycardic, mildly dyspneic, with cold extremities, and no significant signs of congestion. Electrocardiography revealed atrial fibrillation with rapid ventricular response, chest radiography showed cardiomegaly with pulmonary congestion, and echocardiogram showed predominant left-sided heart failure with right ventricular systolic dysfunction. He was diagnosed with cardiogenic shock. Initial therapy included amiodarone and dobutamine infusion. He had worsening chest pain with elevated troponin, suggesting acute coronary syndrome, and was transferred to the intensive care unit. He received intravenous furosemide with nitrates for worsening acute decompensated heart failure. After five days of stabilization, he remained hypotensive with adequate organ perfusion. Sacubitril/valsartan was initiated on day seven and titrated before discharge.

Discussion: Management of CS focuses on restoring perfusion and stabilizing hemodynamics. GDMT is usually deferred during acute shock

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but can be safely initiated once perfusion is adequate. Hypotension should not preclude therapy, including the Angiotensin Neprilysin Inhibitor (ARNI) under adequate monitoring. Post-discharge follow-up is essential to optimize patient outcomes.

Result : After stabilization, the patient remained hypotensive but clinically stable, allowing initiation of ARNI therapy due to its potential benefit. Other GDMT were deferred due to clinical considerations and limited resources. The patient improved clinically and tolerated the therapy, enabling discharge.

Conclusion: GDMT initiation and optimization can be safely performed in hypotensive patients with preserved organ perfusion. Individualized, physiology-based decision-making is essential in managing cardiogenic shock, even in resource-limited settings.

Keywords: Cardiogenic shock, Heart failure, GDMT, ACS

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A case of Superimposed Preeclampsia with fetal bradycardia before delivery: Role of Nitrate

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Background: Superimposed preeclampsia in pregnant women with chronic hypertension is a high-risk obstetric condition that can lead to impaired uteroplacental perfusion and fetal distress. Prompt and controlled maternal hemodynamic management is key to improving uteroplacental blood flow and preventing maternal deterioration.

Intravenous nitrates, particularly nitroglycerin, are rapid-acting vasodilators that have the potential to improve uteroplacental perfusion by reducing systemic and uterine vasoconstriction, thereby improving fetal oxygenation and stabilizing the fetal heart rate.

Case Illustration: Female, 27 y.o pregnant 39 weeks with headache and preparing for delivery with section caesaria and current crisis hypertension and superimposed preeclampsia. Patient with history of asthma. From physical examination blood pressure 186/85 mmHg, normal ECG and normal echocardiogram. CTG showing decreased fetal heart rate 108 -128 bpm. Patient got a nitrogliserin intravenous start 10 mcg/min and titration until 50 mcg/min with target blood pressure systolic 140-160 mmHg. Then patient then provide delivery with caesarean section and outpatient 2 days after.

Discussion: Nitroglycerin is a fast-acting vasodilator that release of nitric oxide, thereby reducing preload and afterload, increasing vascular perfusion without significantly reducing cardiac output. Intravenous nitrates has the potential to improve uteroplacental perfusion by reducing systemic and uterine vasoconstriction, thereby improving fetal oxygenation and stabilizing fetal heart rate.

Conclusion: Intravenous nitrates have the potential to provide clinical benefit as supportive therapy in pregnant women with superimposed preeclampsia and fetal bradycardia by improving maternal hemodynamics and uteroplacental perfusion. Their use can be considered as a bridge therapy in the management of obstetric emergencies with close maternal and fetal monitoring.

Keywords: Superimposed preeclampsia; Fetal bradycardia; Nitrate

HYPERTENSION MANAGEMENT IN A HEMODIALYSIS PATIENT: A CASE OF ACUTE SYMPTOMATIC SEIZURE WITH SUBARACHNOID HEMORRHAGE

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Introduction: Hypertension affects 70–80% of hemodialysis patients and remains a major contributor to morbidity and mortality. Volume overload, sympathetic activation, and renin–angiotensin–aldosterone system dysregulation complicate management. Early recognition and integrated volume and pharmacologic control are essential to prevent catastrophic complications such as seizures and intracranial hemorrhage.

Case Illustration: A 21-year-old female with chronic kidney disease stage 5 (CKD-5) on hemodialysis (HD) presented with dyspnea, edema, and severe hypertension (151/89 mmHg), followed by generalized tonic-clonic seizures. Laboratory results showed severe anemia (Hb 3.7 g/dL), hyperkalemia (6.2 mEq/L), metabolic acidosis, and markedly elevated creatinine (15.94 mg/dL). Brain CT revealed a left frontal subarachnoid hemorrhage. Echocardiography showed left ventricular hypertrophy with pleural effusion, consistent with volume overload.

Discussion: The hypertensive emergency was driven predominantly by inadequate volume control and metabolic derangements. Management focused on immediate volume correction via hemodialysis, optimization of HD prescription, and control of blood pressure with a target systolic

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blood pressure of 140-160 mmHg. Correction of electrolyte imbalance and acidosis reduced seizure risk. The case highlights that hypertension in hemodialysis patients is primarily volume-dependent and requires personalized blood pressure targets and multidisciplinary coordination between nephrology and neurology.

Result: After three hemodialysis sessions and medication optimization, the patient's blood pressure stabilized, edema resolved, and neurological symptoms subsided. Follow-up labs showed correction of anemia (Hb 7.7 g/dL) and improved metabolic parameters.

Conclusion: Early detection and integrated management of hypertension through dialysis optimization and targeted therapy can avert neurological complications and enhance outcomes in young hemodialysis patients.

Keyword: Hypertension; Hemodialysis; Subarachnoid hemorrhage; CKD stage 5; Volume control.

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When Treatment Turns into a Trigger: Steroid-Induced Recurrent Hypertensive Emergency in a Child with Mixed Nephritic–Nephrotic Syndrome

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ABSTRACT

Introduction: Hypertensive emergency in children is an uncommon yet devastating condition, predominantly caused by secondary hypertension related to renal disease. Hypertensive encephalopathy represents one of its most severe neurological complications. In pediatric patients with mixed nephritic–nephrotic syndrome, both the underlying renal pathology and its treatment may critically influence blood pressure regulation, creating a challenging therapeutic dilemma.

Case Description: A 13-year-old boy with poorly controlled hypertension presented with recurrent afebrile seizures and generalized edema. On admission, he was obtunded with a blood pressure of 211/176 mmHg. Laboratory evaluation revealed significant proteinuria and hematuria, hypoalbuminemia (1.96 g/dL), and hypercholesterolemia (503 mg/dL), with preserved renal function. Neuroimaging revealed no abnormalities. Intensive antihypertensive, diuretic, and albumin therapy achieved hemodynamic stabilization. Strikingly, after initiation of prednisone, hypertension recurred despite ongoing antihypertensive treatment.

Discussion: Renal parenchymal disease is the leading cause of

hypertensive emergencies in children. Cerebral autoregulatory failure explains the development of seizures and encephalopathy. Corticosteroids may worsen secondary hypertension through sodium retention and increased vascular reactivity, particularly in patients with renal disease. This case highlights an important therapeutic pitfall in which steroid therapy triggered recurrent hypertensive crisis after apparent stabilization.

Conclusion: Hypertensive encephalopathy may be the initial presentation of mixed nephritic–nephrotic syndrome in children. Corticosteroid therapy can precipitate recurrent hypertensive emergencies. Careful timing of steroid initiation, close hemodynamic monitoring, and appropriate diagnostic evaluation, including immunological studies and consideration of renal biopsy, are essential to guide safe treatment and prevent neurological complications.

Keyword: Hypertensive Emergency, Pediatric Hypertension, Secondary Hypertension, Corticosteroids.

DRUG-INDUCED GINGIVAL OVERGROWTH (DIGO) IN HYPERTENSIVE PATIENTS WITH END-STAGE CHRONIC KIDNEY DISEASE: A SERIAL CASE REPORT

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Abstract

Background: Drug-induced gingival overgrowth (DIGO) is a common adverse effect of calcium channel blockers, particularly amlodipine. This condition impairs mastication, aesthetics, and quality of life, especially in patients with end-stage chronic kidney disease (CKD) undergoing long-term antihypertensive therapy.

Case Illustration: We report three cases of patients diagnosed with end-stage CKD on Continuous Ambulatory Peritoneal Dialysis (CAPD) and hypertension treated with amlodipine. Case 1 (female, 28 years): amlodipine 10 mg for 2 years, BP 170/90 mmHg, gingival swelling and bleeding. Case 2 (male, 28 years): amlodipine 5-10 mg for 12 years, BP 180/100 mmHg, gingival swelling and bleeding. Case 3 (female, 32 years): amlodipine 5-10 mg for 10 years, BP 170/100 mmHg, gingival swelling without significant bleeding.

Discussion: All three patients exhibited DIGO symptoms, including gingival swelling with or without bleeding, after long-term amlodipine therapy (doses 5–10 mg). Amlodipine was discontinued in all cases;

gingivectomy was performed in two patients, while one refused surgical intervention and underwent conservative monitoring.

Results: All patients showed significant improvement in mastication and aesthetics following amlodipine discontinuation, regardless of whether they underwent gingivectomy or conservative management.

Conclusion: Long-term amlodipine use is associated with DIGO in patients with end-stage CKD. Optimal management involves drug discontinuation and surgical intervention (gingivectomy) to restore oral function and comfort.

Keywords: Drug-induced gingival overgrowth, amlodipine, chronic kidney disease, CAPD, gingivectomy.

PD-169**Hypertension, the Silent Enemy: NSTEACS With Advanced CKD and Discordant Renal Artery Imaging—An OMT-First Case Report**

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ABSTRACT

Background: Uncontrolled hypertension accelerates vascular injury and target-organ damage, predisposing to acute coronary syndromes and chronic kidney disease. When blood pressure appears treatment-resistant, secondary causes must be addressed to avoid unnecessary

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renal interventions.

Case Presentation: A 60-year-old woman with a 20-years hypertension (poor adherence) and type 2 DM, presented with typical angina and hypertensive emergency (BP 201/117 mmHg). ECG showed ischemic changes; hs-troponin I was 2405 consistent with NSTEMI. Coronary angiography revealed left main and calcified three-vessel disease. Ramipril and carvedilol were started for BP control, but creatinine rose from 2.4 to 4.2 mg/dL, so ACEi was withheld. Despite supervised multidrug therapy including diuretic during hospitalisation, BP remained above target, consistent with apparent resistant hypertension. Renal work-up was discordant: duplex ultrasound was normal while renal angiography showed right renal ostial narrowing with slow left renal flow. ACEi was documented as contraindicated. OMT strategy was chosen with DAPT, 40 mg atorvastatin, carvedilol, ISDN, nicardipin, and furosemide. At 1-month follow-up, BP improved to 140–150/80–90 mmHg with stable renal function (Cr 3.0–3.5 mg/dL). At 3-month follow-up, home BP ranged between 135–140/80–85 mmHg without recurrent angina or HF symptoms, indicating clinical response to OMT. Guidelines suggest SBP <120 mmHg, but evidence is less certain in advanced CKD and targets must be individualized. This case prioritized stepwise BP reduction. Renal revascularization was deferred given limited resource and routine benefit.

Conclusion: In a cardio-renal high-risk patient with apparent resistant hypertension and discordant renal imaging, OMT-first approach with close follow-up is a pragmatic and evidence-aligned strategy.

Keywords: hypertensive emergency; renal artery stenosis; acute coronary syndrome; chronic kidney disease; optimal medical therapy

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Hypertensive Emergency with Sudden Subconjunctival Hemorrhage, B-lineage Acute Lymphoblastic Leukemia, And Metabolic Syndrome

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ABSTRACT

Introduction: Hypertensive emergency is a life-threatening condition, marked elevation in blood pressure that is associated with acute end-organ damage that requires appropriate therapy to treat progressive organ dysfunction, such as subconjunctival hemorrhage (SCH) can be a sign of uncontrolled high blood pressure. Hypertension is strongly associated with metabolic syndrome through the pathophysiology which involves obesity. Metabolic syndrome is a cluster of conditions including hypertension, abdominal obesity, high blood sugar, high triglycerides, and low HDL cholesterol, significantly raising risks for heart disease, stroke, and type 2 diabetes. The treatment of B-lineage acute lymphoblastic leukemia (B-ALL) related metabolic side effects, including metabolic syndrome and hypertension.

Case: 30-years-old B-lineage acute lymphoblastic leukemia woman with severe hypertension and sudden left eye bleeding. The patient also have metabolic syndrome. The physical examination found that blood pressure was 220/130mmHg, pulse is 81 beats per minute (bpm),

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respiratory rate 20x/minute, SpO₂ 99%, body weight 148 kg, height 170 cm, BMI 51.2kg/m². The Blood tests showed hemoglobin 7.9 g/dl, thrombocyte 19x10³/uL, leukocytes 90.200/mm³, ureum 18mg/dl, creatinine 0.77mg/dl, triglyceride 284 mg/dl, LDH 2022 U/L, PT 14.3(p), 16.1(c), APTT 29.6(p), 33.5(c). The result of immunophenotyping was Cd34(+), CD79a(+), CD 19(+). The non Pharmacological treatments are low-fat and low-calorie diet, blood transfusion, continue evaluation of sub conjungtival hemorrhage by ophthalmologist. The pharmacological treatments administered were drip of nicardipin with a targeted reduction in mean arterial pressure (MAP) of 20–25% within the first 1–2 hours, eye drops, and also chemotherapy.

Conclusion: Hypertensive emergency with subconjunctival hemorrhage (SCH) presentation can indicate any serious underlying etiology that needs prompt treatment as in this patient requiring further evaluations. Mangement are multidisciplinary, with aggressive treatment was given to reduce blood pressure and further observations for SCH. The chemotherapy is important for the prognosis of this patient. Balancing diet is other important program for balancing and increase life quality of patient.

Keyword: Hypertensive emergency; Subconjunctival hemorrhage; B-ALL; Metabolic syndrome.

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The Hypertensive Paradox: Hemorrhagic Stroke Revealing a Stanford Type B Aortic Dissection

Introduction: Uncontrolled hypertension is a leading cause of both hemorrhagic stroke and aortic dissection, though these conditions rarely present together. Aortic dissection usually comes with chest pain or malperfusion symptoms, but when it presents as a hemorrhagic stroke, it can be easily missed. This case highlights the diagnostic and management challenge when two life-threatening conditions present together.

Case Illustration: A 53-year-old male with long-standing uncontrolled hypertension and a history of smoking presented with sudden right-sided weakness and slurred speech while fishing. He denied chest pain or difficulty breathing and had no prior history of cardiovascular issues. His BP on arrival was 228/135 mmHg. CT scan revealed a left basal ganglia hemorrhage (~28.9 ml), but chest X-ray showed cardiomegaly, aortic dilation, and mediastinal widening, suggesting aortic dissection. Further imaging with CT angiography confirmed a Stanford type B (DeBakey III) aortic dissection, extending from the aortic arch to the iliac bifurcation, with mural thrombus in the false lumen.

Discussion: The combination of hemorrhagic stroke and aortic dissection in this patient is rare, but it underscores the importance of considering vascular emergencies in hypertensive patients with neurological symptoms. The mediastinal widening and aortic dilation on chest X-ray were crucial in prompting further investigation, leading to the diagnosis of aortic dissection. Managing this case was complex, as lowering blood pressure too quickly could worsen the stroke, but failing to control it could increase the risk of aortic rupture.

Result: Blood pressure was controlled with IV nicardipine, followed by oral antihypertensives. Given the type B dissection and absence of rupture, conservative management was decided. The patient remained stable and was discharged with follow-up care for both conditions.

Conclusion: This case highlights the diagnostic paradox when hemorrhagic stroke masks aortic dissection, especially in patients with severe hypertension. Early recognition and coordinated management are critical in preventing catastrophic outcomes.

Keywords: Hypertensive Emergency; Hemorrhagic Stroke; Aortic Dissection; Stanford Type B; Acute Aortic Syndrome.

Recurrent Acute Coronary Syndrome with Sequential Multivessel Percutaneous Coronary Intervention in a Patient with Congenital Solitary Kidney, Hypertension, and Advanced Chronic Kidney Disease: Contrast-Induced Nephropathy Risk Management

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Introduction: Hypertension is a major contributor to both cardiovascular disease and progressive renal dysfunction. Management of acute coronary syndrome (ACS) in patients with congenital solitary kidney (CSK) and advanced chronic kidney disease (CKD) is particularly challenging due to the increased risk of contrast-induced nephropathy (CIN).

Case Illustration: A 41-year-old man with a history of hypertension and diabetes mellitus presented with three consecutive episodes of non-ST-elevation ACS over a three-month period (October–December 2025). A history of congenital solitary kidney was obtained from anamnesis. During the latest admission, serum creatinine was 2.75 mg/dL, consistent with acute-on-chronic kidney disease stage IV attributed to cardiorenal syndrome after internal medicine consultation. The CIN risk score was 11, indicating high risk. Coronary angiography revealed significant coronary artery disease requiring sequential percutaneous coronary interventions (PCI): right coronary artery intervention during the first episode, left anterior descending artery during the second, and treatment of in-stent restenosis of the right coronary artery during the third episode. Given the high CIN risk and hypertensive background,

a renal-protective strategy emphasizing careful contrast selection and contrast volume minimization was applied. Early PCI was performed two days after stabilization. Serum creatinine improved to 1.88 mg/dL two days post-procedure.

Discussion: This case underscores the complex interaction between hypertension, recurrent ACS, and renal dysfunction in patients with congenital renal anomalies. Long-standing hypertension likely contributed to both accelerated coronary atherosclerosis and renal vulnerability, increasing the risk of cardiorenal syndrome and CIN. Despite advanced CKD, early invasive management was pursued based on careful risk–benefit assessment. The improvement in renal function following revascularization supports myocardial ischemia as a major driver of renal impairment rather than contrast-related injury, highlighting the importance of individualized clinical decision-making.

Conclusion: In patients with hypertension, congenital solitary kidney, and advanced CKD, repeated PCI may be performed safely when meticulous contrast minimization and multidisciplinary management strategies are applied.

Keywords: Acute coronary syndrome; hypertension; congenital solitary kidney; chronic kidney disease; contrast-induced nephropathy.

HYPERTENSION MANAGEMENT IN GERIATRIC PATIENT WITH MULTIPLE COMORBIDITIES

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Background: Hypertension is the most prevalent chronic condition in geriatric populations and frequently coexists with heart failure, chronic kidney disease, and atherosclerotic disease. Recent guidelines recommend BP targets <130/80 mmHg when tolerated, but allow more relaxed goals (for example <150/90 mmHg) in older adults with multimorbidity and limited physiological reserve.

Case Illustration: A 65-year-old man with long-standing uncontrolled hypertension, and ischemic heart disease presented with dyspnea, lethargy, poor intake, and behavioral changes. Evaluation showed heart failure with reduced ejection fraction, stage 4 CKD with acute injury episodes, abdominal aortic aneurysm with thrombus, pleural effusions, hepatomegaly, and encephalopathy.

Discussion: The therapeutic tension between aggressive BP lowering to prevent stroke, aneurysm expansion, heart failure progression and the risk of hypotension, renal hypoperfusion, worsening frailty in a multimorbid geriatric patient. Individualized BP targets based on frailty, multimorbidity, and treatment tolerance are needed, while using guideline-directed combinations (beta-blockers, renin-angiotensin system blockade/ARNI, diuretics) tailored to kidney function and

hemodynamic status. In patients with heart failure with reduced ejection fraction and abdominal aortic aneurysm, combinations including beta-blockers, renin-angiotensin system blockade or angiotensin receptor-neprilysin inhibitors, and judicious diuretic use are strongly supported, but must be tailored to kidney function and hemodynamic status.

Result: Careful titration of antihypertensives, volume control, albumin correction, and heart failure therapy achieved stable BP, improved symptoms, and preserved renal function.

Conclusion: In geriatric patients with extreme multimorbidity, rigid BP targets are inadequate; individualized, patient-centered strategies that integrate heart failure, CKD, and aneurysm recommendations are essential for safe hypertension management.

Keywords: Hypertension; Geriatric; Multimorbidity; Chronic kidney disease; Abdominal aortic aneurysm.

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Nicardipine In Patient With Acute Pulmonary Oedema And Hypertensive Emergency : A Case Report

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Introduction: Pulmonary oedema is a consequence of acute heart failure, which results from a sudden decrease in stroke volume. Nitroglycerin is a vasodilator with beneficial effects in Acute Pulmonary Oedema accompanied by hypertension.

Case Illustration

A 44-year-old male presented to the ED with shortness of breath and a history of hypertension. Vital signs showed BP of 200/120 mmHg, HR 95 beats/minute, RR 40 breaths/minute, and SpO₂ 85% on room air.

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Physical examination revealed elevated JVP, wheezing, rhonchi, and bilateral pitting edema. Electrocardiogram showed LVH. Chest X-ray findings were diagnostic of APO and cardiomegaly. Echocardiography results show LVEF 39%, TAPSE 22 millimeters, concentric LVH, segmental akinesis and hypokinesis, grade I diastolic dysfunction. Blood tests revealed leukocytosis and elevated liver enzymes. Initial treatment included oxygen with NRM, furosemide, and NTG infusion titrated up to 60 mcg/min. This regimen failed to adequately control the blood pressure, which remained critically elevated at 200/130 mmHg. Therapy was then escalated by switching from NTG to an Nicardipine infusion (starting at 1 mcg/kg/min). This intervention resulted in a significant BP reduction to 135/80 mmHg within 30 minutes.

Discussion

Nitroglycerin is recommended as a first-line agent for Acute Heart Failure Syndrome with coexistent hypertension in several guidelines. Nitrates induce vascular smooth muscle cells to generate nitric oxide, which stimulates guanylate cyclase, resulting in smooth muscle relaxation. Nicardipine, a dihydropyridine calcium channel blocker, acts rapidly and is often used to treat hypertensive emergencies and postoperative hypertension due to its favourable safety profile. Its primary mechanism is arterial vasodilation, leading to a decrease in blood pressure.

Result

In this case, however, high-dose NTG failed to control the patient's blood pressure.

Conclusion: In this patient, NTG was ineffective in lowering blood pressure, whereas intravenous nicardipine achieved rapid control. This observation aligns with several studies demonstrating the effectiveness of nicardipine in managing hypertension associated with APO.

Keywords: Acute Lung Oedema; Acute Pulmonary Oedema; Hypertensive Emergency; Nicardipine; Nitroglycerin.

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Marfan Syndrome: A Rare Case That Affect The Heart**Ida Bagus Erik Tahayana¹, I Gede Bagus Gita Pranata Putra²***¹University of Wijaya Kusuma, Surabaya, Indonesia**²Sanjiwani Regional General Hospital, Gianyar, Indonesia*

Background: Marfan syndrome is an autosomal dominant connective tissue disorder caused by mutations in the FBN1 gene, leading to multisystem involvement, particularly affecting the cardiovascular system. Aortic root dilatation and aortic regurgitation represent the most serious complications and are the leading causes of morbidity and mortality.

Case Illustration: We report a 33-year-old woman presenting with syncope, exertional dyspnea, and palpitations. Physical examination revealed a cardiac murmur. Transthoracic echocardiography demonstrated marked aortic root dilatation, severe aortic regurgitation, and a fistulous communication draining into the aortic arch and sinus of Valsalva. Based on clinical, imaging, and phenotypic findings, the patient was suspected of having Marfan syndrome with advanced cardiovascular involvement.

Conclusion: This case highlights the importance of early recognition, regular surveillance, and timely referral for definitive management in patients with Marfan syndrome to prevent life-threatening complications.

Keywords: Marfan syndrome, aortic root dilatation, aortic regurgitation, case report.

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Introduction : Marfan syndrome is a hereditary connective tissue disorder with an estimated prevalence of 1 in 5,000 individuals worldwide. It is caused by mutations in the FBN1 gene encoding

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fibrillin-1, a major component of extracellular microfibrils. The disease manifests with variable involvement of the skeletal, ocular, and cardiovascular systems. Among these, cardiovascular complications remain the principal determinant of prognosis.

Progressive aortic root dilatation, aortic regurgitation, and aortic dissection are the most feared manifestations. Without appropriate surveillance and intervention, these complications may lead to sudden death at a young age. This case report aims to describe the clinical presentation, diagnostic evaluation, and management considerations of a young woman with suspected Marfan syndrome complicated by severe aortic involvement.

Case Report: A 33-year-old woman presented to the emergency department with recurrent syncope, generalized weakness, exertional dyspnea, and palpitations. She had no previous history of cardiovascular disease but reported progressive shortness of breath over several months.

On physical examination, the patient appeared asthenic with long extremities and arachnodactyly. Blood pressure was within normal limits, but cardiac auscultation revealed a high-pitched diastolic murmur along the left sternal border. Peripheral pulses were bounding.

Chest radiography demonstrated cardiomegaly with prominent aortic contour. Transthoracic echocardiography revealed marked dilatation of the aortic root, severe aortic regurgitation, and a fistulous tract draining into the aortic arch and sinus of Valsalva. Left ventricular dilatation with preserved systolic function was also noted.

Based on the clinical phenotype and imaging findings, a diagnosis of suspected Marfan syndrome with severe cardiovascular involvement was established. The patient received medical therapy for hemodynamic stabilization and was referred to a tertiary cardiovascular center for further evaluation and surgical planning.

Discussion: Marfan syndrome is a prototypical disorder of connective tissue with marked phenotypic heterogeneity. Cardiovascular involvement, particularly progressive aortic root dilatation, is the hallmark of the disease and the primary cause of premature mortality. The pathophysiology of aortic dilatation in Marfan syndrome is related to structural weakness of the aortic media caused by abnormal fibrillin-1, leading to elastic fiber fragmentation, cystic medial degeneration, and progressive aortic enlargement. These changes predispose patients to aortic regurgitation, aneurysm formation, and acute aortic dissection. In the present case, the patient presented with advanced cardiovascular manifestations at a relatively young age. Syncope and exertional dyspnea may reflect hemodynamic compromise due to severe aortic regurgitation and reduced effective forward flow. The presence of a fistulous communication to the sinus of Valsalva further increased the complexity of this case.

Echocardiography remains the cornerstone of diagnosis and follow-up in Marfan syndrome. Serial measurement of aortic root diameter is essential to guide the timing of surgical intervention. Current guidelines recommend prophylactic aortic root replacement when the diameter exceeds 5.0 cm, or at smaller diameters in the presence of rapid growth, family history of dissection, or severe aortic regurgitation.

Medical therapy with beta-blockers and angiotensin receptor blockers has been shown to reduce the rate of aortic dilatation by decreasing aortic wall stress. However, pharmacological therapy does not eliminate the risk of dissection, and timely surgical intervention remains the definitive treatment.

This case underscores the importance of early diagnosis, systematic surveillance, and multidisciplinary management involving cardiology, genetics, and cardiovascular surgery. In resource-limited settings, delayed referral may result in presentation at an advanced stage with high surgical risk.

Conclusion: Marfan syndrome with severe aortic involvement represents a life-threatening condition requiring early recognition and

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close follow-up. This case highlights the need for heightened clinical suspicion, routine echocardiographic surveillance, and timely referral for surgical management to prevent fatal complications such as aortic dissection and heart failure.

Keywords: *Marfan syndrome, aortic root dilatation, aortic regurgitation, case report.*

References

1. Baumgartner H, Bonhoeffer P, De Groot NM, Haan F, Deanfield JE, Galie N., et al. *ESC Guidelines for the management of grown-up congenital heart disease (new version 2010)*. European Heart Journal. 2010; 31:2915-57.
2. Canadas V, Vilacosta I, Bruna I, Fuster V. *Marfan syndrome. Part 1: Pathophysiology and diagnosis*. Nature Reviews Cardiology. 2010;7(5):256-65.
3. Groth KA, Hove H, Folkestad L, Kasper K, Gaustadnes M, Vejlstrop N, et al. *Prevalence, incidence, and age at diagnosis in Marfan Syndrome*. Orphaet Journal of Rare Disease. 2015; 10(153):1-10.
4. Mahavira A, Siswanto BB. *Diagnosis and management of marfan syndrome*. Jurnal Kardiologi Indonesia. 2013; 34(2):105-12.
5. Pyeritt RE. *Etiology and pathogenesis of the marfan syndrome: Curreny understanding*. Annals of Cardiothoracic Surgery. 2017; 6(6):595-8.
6. Xiao Y, Liu X, Guo X, Liu L, Jiang L, Wang Q, et al. *A novel FBN1 mutation causes autosomal dominant marfan syndrome*. Molecular Medicine Report. 2017; 16:7321-28.
7. Defendi GL. *Genetics of marfan syndrome*. 2019. 29 Agustus 2019. <https://emedicine.medscape.com/article/946315-overview#a4>.
8. Isekame Y, Gati S, Antonio J, Bastaenen R, Seshasai SR, Anne C. *Cardiovascular management of adults with marfan syndrome*. European Cardiology Review. 2016; 11 (2):102-10.
9. Grewal N, Groot AC. *Pathogenesis of aortic wall complications in marfan syndrome*. Cardiovascular Pathology.2018; 33(1):62-9.
10. Radke RM, Baumgartner H. *Diagnosis and treatment of Marfan syndrome: an update*. Heart. 2014; 100(17):1382-91.

11. Jessurun CA, Debby AM, Franken R. *An update on the pathophysiology, treatment, and genetics of Marfan syndrome*. Expert Opinion on Orphan Drugs. 2016; 4(6):605-12.
12. Pepe G, Giusti B, Sticchi E, Abbate R, Gensini GF, Nistri S. *Marfan syndrome: Current perspectives*. 2016. 9:55-65.
13. Waduthantri S. *Okular manifestations of Marfan syndrome*. Medical Journal of Dr. D.Y Patil University. 2017; 10(2):118-9.
14. Gehle P, Georgen B, Pilger D, Ruokoznen P, Robinson PN, Salchow DJ. *Biometric and structural ocular manifestation of Marfan syndrome*. Public Library of Science. 2017; 12(9):1-12.
15. Kaissi AA, Zwettler E, Ganger R, Schreiner S, Klauhofer K, Grill F. *Muskuloskeletal abnormalities in patients with marfan syndrome*. Clin Med Insight Arthritis Muskuloskeletal Disorder. 2013; 6:1-9.
16. Loeys BL, Dietz HC, Braverman AC, Callewaert BL, Becker J, Devereux RB, et al. *The revised Ghent nosology for the Marfan syndrome*. J Med Genet. 2010; 47:476-85.
17. Canadas V, Vilacosta Isidre, Bruna I, Valentin F. *Marfan syndrome part 2: Treatment and management of patients*. Nature Reviews Cardiology. 2010; 7(5):266-76.
18. Cui J, Lee L, Sheng X, Chu F, Gibson CP, Aydinian T, et al. *In vivo characterization of doxycycline-mediated protection of aortic function and structure in a mouse model of Marfan syndrome-associated aortic aneurysm*. Nature Scientific Reports. 2019; 9(2071):1-

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A Elderly Man With Hypertensive Crisis, Stroke, and Elevated Hematocrit

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Introduction: Elevated hematocrit with concurrent hypertensive emergency and acute ischemic stroke requires immediate syndromic treatment regardless of etiological confirmation. Blood pressure and blood viscosity management present competing therapeutic priorities in these patients.

Case Presentation: A 63-year-old hypertensive male presented with acute-onset headache progressing to right hemiparesis. Examination revealed hypertensive emergency (BP 240/150 mmHg, MAP 180) with elevated haematocrit (55.7%) and haemoglobin (18.6 g/dL). CT imaging confirmed left thalamic-capsular ischemic infarction. Clinical features suggested primary polycythaemia vera differential diagnose with secondary erythrocytosis though JAK2 mutation testing and bone marrow biopsy were unavailable. Treatment included nicardipine infusion, phlebotomy, isotonic saline hydration, antiplatelet therapy, and citicoline was started.

Result: Mean arterial pressure target bellow 153 mmHg, and sequential haematocrit reduction (55.7%→52.2%→49.2%) was achieved without complications. The patient demonstrated neurological improvement and was referred to tertiary care for definitive diagnosis..

Discussion: Blood pressure management balances competing priorities: preventing reperfusion hemorrhage versus maintaining cerebral

perfusion. current evidence recommends: (1) aggressive hematocrit reduction via phlebotomy to target <45% to decrease blood viscosity; (2) careful blood pressure management using nicardipine (vasodilator preserving cerebral perfusion) rather than aggressive antihypertensives that compromise stroke region; (3) therapeutic phlebotomy with isotonic saline hydration to prevent hypovolemic complications; (4) low-dose aspirin initiated after hemorrhagic complications excluded, which reduces thrombotic recurrence by 67%; (5) consideration of cytreductive therapy (hydroxyurea) for high-risk patients.

Conclusion: Syndromic phlebotomy-based management is safe and effective in first-level hospitals without etiological confirmation, while tertiary facilities provide diagnostic clarification and long-term cytreductive therapy.

Keywords: elevated hematocrit; hypertensive emergency; ischemic stroke; syndromic treatment; phlebotomy; etiological diagnosis.

PD-177

Cardiogenic Shock Following Multiple Bilateral Lacunar Infarction in Acute Coronary Syndrome: A Case Report

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Background: Acute coronary syndrome (ACS) with cardiogenic shock is associated with systemic hypoperfusion. However, cerebral complications such as multiple bilateral lacunar infarctions are rarely reported.

Case Illustration: A 73-year-old male patient came to emergency room with typical anginal chest pain and dyspnea, accompanied by cardiogenic shock and elevated cardiac enzyme. Loss of

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consciousness and hemiparesis occurred during hospitalization. The patient had a history of uncontrolled hypertension, dyslipidemia, and smoking. Electrocardiography showed ST segment depression in anteroseptal lead with a new-onset right bundle branch block. The chest x-ray showed cardiomegaly with left ventricular hypertrophy. Echocardiography revealed a left ventricular ejection fraction is 44%. Brain computed tomography demonstrated multiple bilateral lacunar infarcts in the basal ganglia. The patient received dual antiplatelet, parenteral anticoagulation, statins and inotropic support.

Discussion: Multiple uncontrolled cardiovascular risk factors like uncontrolled hypertension, dyslipidemia, and smoking may lead to endothelial injury and atherosclerosis resulting in ACS. Hypertension can induced cardiac remodelling, such as left ventricular hypertrophy, which may progress to reduced ejection fraction. Impaired cardiac function may subsequently lead to cardiogenic shock, characterized by low mean arterial pressure (MAP). Reduce MAP may caused systemic hypoperfusion and affect cerebral blood flow. Progression to a low-flow state in cerebral small vessels may contribute to the development of multiple bilateral lacunar infarctions.

Result: Following close monitoring and medical management, hemodynamic stability was established accompanied by improvement in the patient's level of consciousness. The patient was discharged in stable condition.

Conclusion: This case suggests an involvement of cardiogenic shock in ACS-related cerebral infarction.

Keyword: Acute Coronary Syndrome; Hypertension; Cardiogenic Shock; Lacunar Infarction; Cerebral Hypoperfusion

PD-178

Hypertension and Elevated Blood Pressure: Lifestyle and Health Behaviours in a Case Series from Wonorejo Village, Indonesia

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ABSTRACT

Background: Hypertension is becoming a serious global health concern, with increasing prevalence worldwide each year. The management of hypertension is affected by lifestyle and health awareness of the population, especially in developing countries. This case series describes the lifestyle and health behavior of six individuals with elevated blood pressure, based on the ESC 2024 classification, in Wonorejo Village, Singosari District, Malang.

Case Illustration: This case series involved six individuals from different socioeconomic backgrounds, consisting of four patients with hypertension and two individuals with elevated blood pressure. Blood pressure was measured twice using a standard sphygmomanometer.

Results: Five out of six individuals had never undergone routine medical check-ups or participated in health education programs. All cases were exposed to cigarette smoke, either actively or passively. Physical activity levels were low, generally limited to household ambulation. Two hypertensive individuals reported consuming sweetened coffee up to three times daily. Regarding treatment adherence, one patient discontinued amlodipine after perceived blood pressure improvement, while another used antihypertensive medication irregularly.

Discussion: Low education levels and health literacy, with limited access to preventive care, may contribute to suboptimal hypertension management in rural communities. Cigarette smoke exposure, low physical activity, and excessive consumption of sweetened beverages,

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are recognized contributors to elevated blood pressure. Poor medication adherence may increase the risk of disease progression.

Conclusion: This case series demonstrates the presence of low educational attainment, exposure to cigarette smoke, lack of physical exercise, high consumption of sweetened coffee, and poor treatment adherence in this specific population.

Keywords: *Hypertension; blood pressure; cigarette smoking; developing countries; health behavior.*

PD-179

Integrative Network Pharmacology and Molecular Docking Reveal β -Adrenergic Involvement in the Antihypertensive Potential of *Averrhoa bilimbi*

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Background: *Averrhoa bilimbi* is an Indonesian herbal medicine investigated for antihypertensive effects. Previous preclinical and limited clinical studies suggested blood pressure regulation through nitric oxide mediated vasodilation and antioxidant activity. However, molecular targets underlying these effects remain poorly defined.

Objective: This *in silico* study applies integrative network pharmacology and molecular docking to identify the multi-target mechanism of *Averrhoa bilimbi* compounds.

Methods: *Averrhoa bilimbi* compounds were retrieved from Knapsack and SMILES obtained via PubChem for ADME evaluation using SwissADME. Toxicity was predicted using ADVER-Pred. Potential targets were identified via SwissTarget and intersected with hypertension-related genes from GeneCards using Interactivenn. GO enrichment and KEGG analyses were performed in ShinyGO. Hub genes were identified using STRING and Cytoscape. Molecular docking was conducted in PyRx, visualized with Discovery Studio, and validated by redocking in PyMol.

Results: Twenty-two *Averrhoa bilimbi* compounds were identified and four (Phytosphingosine, 4-Hydroxy-8-sphingenine, Isoavocadienofuran, and Codonopsine) passed ADME evaluation. Toxicity prediction indicated a high likelihood of Arrhythmia (Pa/Pi, 0.494/0.113) for Codonopsine and Nephrotoxicity (Pa/Pi, 0.376/0.098) for Phytosphingosine. Intersection analysis identified ADRB2, ADRB1, DRD3, ADRB3, CHEK1, and EGFR. GO highlighted β -adrenergic receptor activity and Norepinephrine-epinephrine-mediated vasodilation, while KEGG showed regulation of renin secretion and lipolysis. Although ADRB2 was the main hub, ADRB1 was selected due to paradoxical β_2 blood-pressure regulation. Docking showed favorable binding for three compounds, while Codonopsine bound the orthosteric residue ASP 1138 despite lower affinity. Redocking RMSD was 1.744.

Conclusion: β -Adrenergic-RAAS modulation mediates *Averrhoa bilimbi* antihypertensive effects.

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Prognostic Significance of REN Gene Expression in Renal Cell Carcinoma: A Kaplan-Meier Survival Analysis

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Background: The renin angiotensin system (RAS) is frequently dysregulated in renal malignancies. Kidney renal clear cell carcinoma (KIRC) is one of the most common and aggressive form of renal malignancy. While RAS inhibition is explored as an adjuvant therapy, the direct prognostic value of REN mRNA expression remains unknown. We utilized survival analysis to determine if baseline REN expression levels correlate with overall survival (OS) in patients with KIRC.

Objective: This study utilized survival analysis to determine if baseline REN expression levels correlate with overall survival (OS) in patients with KIRC.

Methods: Clinical survival data and gene expression profiles of 200 patients were analyzed. The data was grouped into high expression and low expression groups based on median REN values. Survival probability was estimated using the Kaplan-Meier method, and statistical significance was assessed using the log-rank test.

Results: The analysis revealed a median survival time of 1450 days for the high expression group versus 1210 days for the low expression group. However, the survival distributions were not statistically distinct, indicating that REN expression level is not an independent predictor of mortality.

Conclusion: REN expression alone does not serve as a prognostic biomarker for renal cell carcinoma. This suggests that the survival

benefits observed with RAS inhibitors in oncology may be driven by systemic hemodynamic stability rather than direct tumor cell modulation.

Keywords: *Kidney Renal Clear Cell Carcinoma, Renin-Angiotensin System, Kaplan-Meier Survival Analysis, Prognosis, Overall Survival*

PD-181

Calm Amid the Crisis: Effective Blood Pressure Control with Labetalol Compared to Nicardipine in Hypertensive Emergency Complicating Acute Stroke – A Case Report

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Abstract

Background : Hypertensive emergency complicating acute stroke demands meticulous blood pressure control to prevent secondary cerebral injury. Optimal approach to blood pressure management in acute ischemic stroke is still unknown. Among intravenous antihypertensive agents, labetalol and nicardipine are frequently employed due to their rapid onset and titratable effects. Nevertheless, their cardiovascular and cerebrovascular profiles differ, which may influence clinical decision-making in acute stroke settings.

Case Illustration : We present 68 years-old female patient with hypertensive emergency that there is tachycardia complicated by underlying acute stroke, hypertensive heart disease and coronary artery disease. Intravenous labetalol, administered as a 10-mg slow

bolus followed by continuous infusion at 1 mg/min, achieved a gradual and stable reduction in blood pressure without adverse cardiovascular or neurological events.

Discussion : Labetalol's combined α - and β -adrenergic blockade enables effective reduction of systemic vascular resistance while maintaining cardiac stability, an advantage in patients with concomitant cardiovascular disease. In this case, labetalol enabled gradual and stable hemodynamic control, supporting its role as preferred first-line agent.

Result : Intravenous labetalol achieved gradual and controlled reduction in blood pressure to target levels without significant blood pressure variability. Hemodynamic stability was maintained, with no cardiovascular or neurological deterioration observed during treatment.

Conclusion : This case highlights the effectiveness of labetalol compared to nicardipine in achieving stable and controlled blood pressure reduction in hypertensive emergency complicating acute stroke. Labetalol provides hemodynamic stability during initial blood pressure reduction. Individualized and physiology-based approach therapy is crucial for optimal outcomes remains essential in acute cerebrovascular management.

Keywords: Blood Pressure, Emergency, Hypertension, Labetalol.



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