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Yogavahi Action Of Rasasindoor In Essential Hypertension: A Comprehensive Ayurvedic And Pharmacological Review

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Abstract

Background: *Rasasindoor, a classical Ayurvedic Rasaushadhi prepared through Puta-processed Parada (mercury) and Gandhaka (sulphur), is acclaimed for its Yogavahi property—facilitating targeted drug delivery without losing its own identity. Essential hypertension, a chronic lifestyle disorder characterized by persistently elevated blood pressure, poses significant cardiovascular risks. Modern pharmacotherapy often addresses symptoms, but side effects and drug resistance are frequent. This review explores the potential of Rasasindoor as a Yogavahi agent in the management of essential hypertension by integrating classical Ayurvedic principles and contemporary pharmacological insights.* ***Aim:*** *To analyze the Yogavahi action of Rasasindoor in the context of essential hypertension based on classical Ayurvedic texts and modern pharmacological interpretations.* ***Objectives:*** *To review classical Ayurvedic references describing the Yogavahi quality of Rasasindoor. To assess the relevance of Rasasindoor in systemic drug delivery, particularly in cardiovascular disorders like essential hypertension. To correlate the pharmacological actions of Rasasindoor with mechanisms of antihypertensive therapy.* ***Methodology:*** *This is a conceptual and literary review based on Ayurvedic texts like Rasa Ratna Samuccaya, Rasa Tarangini, and Bhaishajya Ratnavali, as well as pharmacological databases and scientific literature. The review focused on the therapeutic dynamics of Rasasindoor including its Yogavahi property, potential antioxidant, vasodilatory, and neurohormonal modulating effects relevant to essential hypertension. No clinical or experimental data were included.* ***Results:*** *Rasasindoor, due to its Sookshma, Teekshna, and Yogavahi properties, demonstrates potential for precise cellular targeting in systemic disorders like hypertension. Classical properties such as Rasayana, Balya, and Hridaya strengtheners align with modern pharmacological actions like vasorelaxation, nitric oxide modulation, and antioxidant effects. Preliminary modern studies on mercury-based nanomedicine suggest enhanced bioavailability and tissue-specific drug delivery.* ***Conclusion:*** *Rasasindoor, as a Yogavahi agent, offers a promising integrative approach in the management of essential hypertension by enhancing the efficacy of co-administered drugs, targeting cardiovascular tissues, and minimizing systemic toxicity. Future pharmacodynamic and clinical validation is warranted to establish its safety and efficacy profiles.*

Keywords: *Rasasindoor, Yogavahi, Essential Hypertension, Ayurveda, Nanomedicine, Rasaushadhi*

INTRODUCTION

Essential hypertension is a major non-communicable disorder characterized by persistently elevated arterial blood pressure without any identifiable secondary cause. It accounts for approximately 90 to 95 percent of all hypertension cases and serves as a critical risk factor for cardiovascular morbidity and mortality globally.[1] Despite the availability of modern antihypertensive drugs, issues such as drug resistance, poor compliance due to side effects, and the inability to reverse the pathophysiological root cause remain persistent challenges. Hence, integrative approaches involving traditional systems like Ayurveda are gaining increased attention.[2]

Although the term "hypertension" does not appear verbatim in classical Ayurvedic texts, its pathophysiology can be conceptually mapped to various Vata Prakopaja Vikaras, Raktagata Vikritis, or Dhamani Pratichaya and Dhamani Prapurna as described in Sushruta Samhita.[3] The systemic derangement of Vata Dosha, especially Prana Vata, coupled with Rakta Dushti and aggravated Pitta, plays a vital role in elevating vascular resistance and disrupting hemodynamic equilibrium. Rasayana therapies and Dosha balancing interventions are central in Ayurvedic management strategies.[4]

Rasasindoor is a potent Ayurvedic formulation prepared through intricate Puta procedures using Parada (purified mercury) and Gandhaka (sulphur) in a specific ratio.[5] It is described extensively in texts like Rasa Tarangini and Rasa Ratna Samuccaya. Known for its Rasayana, Yogavahi, and Sookshma properties, Rasasindoor is traditionally used in a wide array of systemic disorders. Its ultra-fine particle size and unique metallic synergy are believed to offer rapid absorption, bioavailability, and targeted action.[6]

The term Yogavahi refers to the property of a substance, especially Parada-based Rasaushadhis, to enhance the potency and targeted delivery of co-administered drugs without altering their essential nature. Rasasindoor exemplifies this property by acting as a therapeutic carrier that facilitates deeper tissue penetration, faster action, and improved bioefficacy.[7] In the context of hypertension, this property becomes crucial for targeting vascular and neurohormonal tissues involved in the regulation of blood pressure.[8]

Modern scientific investigations have started to explore the nanostructural and pharmacodynamic potential of Rasaushadhis. Studies on mercury-based nanomedicines have shown promising antioxidant, anti-inflammatory, and vasorelaxant effects—factors intimately related to hypertension pathogenesis.[9] The Teekshna and Sookshma attributes of Rasasindoor support its rapid systemic activity, while its Balya and Hridaya effects may contribute to cardiac support and vascular modulation.[10]

Given the limitations of conventional therapy and the growing need for safer, effective alternatives, a deeper understanding of Rasasindoor's Yogavahi action in essential hypertension is both timely and essential. This review attempts to bridge classical Ayurvedic theory with modern pharmacological evidence, providing a conceptual framework for further exploration. By evaluating classical references and preliminary scientific findings, the study aims to rationalize the inclusion of Rasasindoor in integrative therapeutic strategies for hypertension management.[11]

Aim And Objectives

Aim:

To critically review and explore the Yogavahi action of Rasasindoor in the management of essential hypertension through Ayurvedic principles and modern pharmacological insights.

Objectives:

1. To review classical Ayurvedic texts describing the Yogavahi property of Rasasindoor.
2. To explain the conceptual and therapeutic role of Rasasindoor in essential hypertension.
3. To analyze potential pharmacological mechanisms of Rasasindoor relevant to blood pressure regulation.
4. To propose an integrative understanding of Rasasindoor as a drug carrier in hypertension therapy.

MATERIAL AND METHODS

This study was conducted as a conceptual and literary review, focusing exclusively on the Yogavahi action of Rasasindoor in the context of essential hypertension. Classical Ayurvedic texts such as Rasa Ratna Samuccaya, Rasa Tarangini, Bhaishajya Ratnavali, and Charaka Samhita were thoroughly examined for references related to Rasasindoor, its Yogavahi property, and Rasayana applications. Additionally, relevant research articles, review papers, and pharmacological studies were sourced from online scientific databases including PubMed, Scopus, and Google Scholar to explore modern interpretations of mercury-based preparations, nanomedicine, and cardiovascular pharmacology. No experimental or clinical data were included; the study aimed to synthesize classical concepts and contemporary scientific findings into a comprehensive theoretical framework.

Conceptual study

Essential hypertension

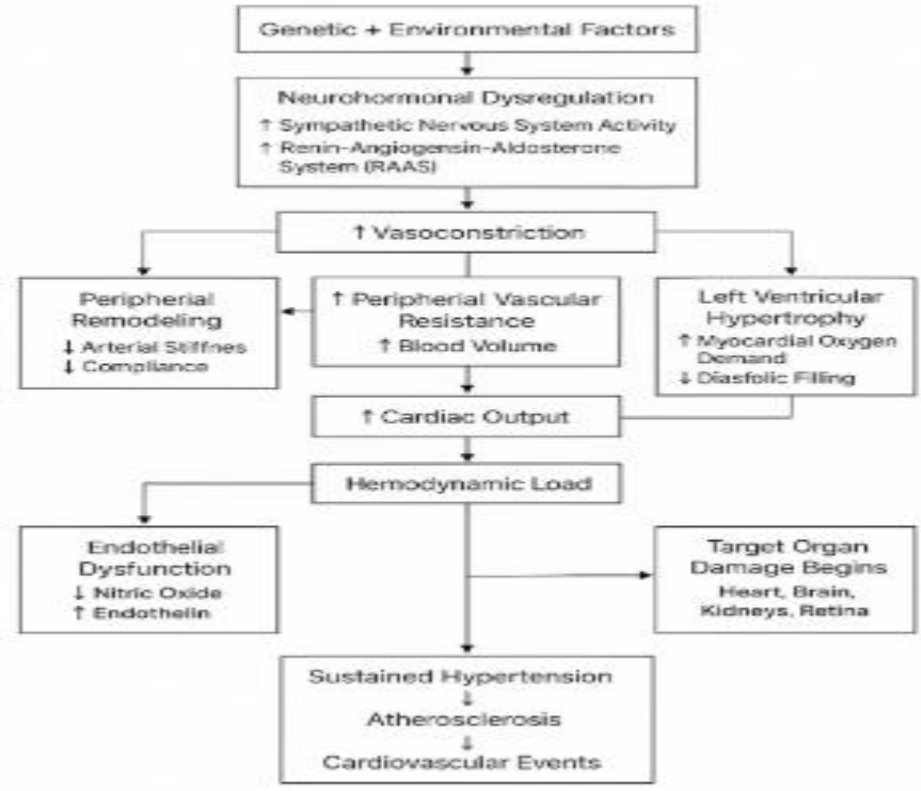
Essential hypertension, also known as primary hypertension, is a chronic medical condition characterized by persistently elevated systemic arterial blood pressure without any identifiable secondary cause. It is diagnosed when systolic blood pressure exceeds 140 mmHg and/or diastolic pressure exceeds 90 mmHg on multiple readings. It is the most common form of hypertension, accounting for approximately 90 to 95 percent of all cases globally. Unlike secondary hypertension, which is attributable to renal, endocrine, or structural

cardiovascular abnormalities, essential hypertension develops insidiously and is influenced by complex genetic, environmental, and lifestyle-related factors.[12]

The exact cause of essential hypertension remains multifactorial. Contributing factors include excessive dietary sodium intake, obesity, physical inactivity, psychosocial stress, alcohol consumption, smoking, aging, and genetic predisposition. Other underlying mechanisms involve increased sympathetic nervous system activity, renin-angiotensin-aldosterone system (RAAS) overactivity, insulin resistance, and endothelial dysfunction. These pathophysiological alterations contribute to increased vascular resistance, altered cardiac output, and impaired sodium-water homeostasis.[13]

The pathophysiology of essential hypertension involves sustained elevation of systemic vascular resistance (afterload) and/or increased cardiac output. Structural and functional changes in blood vessels, including vascular remodeling, arterial stiffness, and endothelial dysfunction, play central roles. Hyperactivity of the RAAS leads to vasoconstriction and fluid retention. Furthermore, chronic low-grade inflammation and oxidative stress contribute to vascular injury and increased peripheral resistance. The failure of baroreceptor sensitivity and autonomic imbalance also perpetuate elevated blood pressure.[14]

Flowchart: Pathophysiology of Essential Hypertension



Essential hypertension is often termed the "silent killer" because it may remain asymptomatic for years. When symptoms do appear, they may include headache, dizziness, palpitations, fatigue, and visual disturbances. If left untreated, it significantly increases the risk of cardiovascular diseases such as myocardial infarction, stroke, heart failure, chronic kidney disease, and retinopathy. Target organ damage progresses insidiously, making early diagnosis and management critical.[16]

Diagnosis is primarily based on repeated blood pressure measurements using a calibrated sphygmomanometer or automated device. Ambulatory or home BP monitoring may be employed to exclude white coat or masked hypertension. Evaluation includes a thorough history, physical examination, and laboratory tests to assess for cardiovascular risk factors, end-organ damage, and to exclude secondary causes. Key investigations include serum electrolytes, lipid profile, fasting glucose, ECG, renal function tests, and urine analysis.[17]

Management of essential hypertension includes both non-pharmacological and pharmacological interventions. Lifestyle modifications such as dietary changes (DASH diet), sodium restriction, weight loss,

regular physical activity, moderation of alcohol, stress reduction, and smoking cessation form the first line of management. Pharmacologic treatment includes antihypertensive agents like ACE inhibitors, ARBs, beta-blockers, calcium channel blockers, and diuretics, tailored to patient comorbidities and tolerability. Long-term compliance and regular follow-up are essential to prevent complications and ensure optimal control.[18]

Rasasindoor

Rasasindoor is a classical Rasaushadhi (herbo-mineral formulation) in Ayurveda, prepared through the Kupipakwa method involving Shuddha Parada (purified mercury) and Shuddha Gandhaka (purified sulphur). It is mentioned in authoritative texts like Rasa Tarangini, Rasa Ratna Samuccaya, and Bhaishajya Ratnavali. The final product is a brilliant red, highly stable, and fine powdered compound with immense therapeutic potency.[19]

Rasasindoor is made using the Kupipakwa technique where equal proportions of Shuddha Parada and Shuddha Gandhaka are triturated thoroughly to form Kajjali. This is then subjected to a controlled heating process in a glass bottle sealed with a clay-smeared cloth. The entire process is performed under specific temperature regulation, known as Puta, until Rasasindoor sublimes and settles at the neck of the bottle in its pure, red crystalline form.[20]

Classically, Rasasindoor is described to have Teekshna (penetrating), Sookshma (minute), Vyavayi (spreading), Ashukari (fast-acting), and Rasayana (rejuvenating) properties. These attributes make it quickly absorbable, highly potent even in minute doses, and effective in treating chronic and systemic disorders. It is also Tridoshaghna, particularly effective in Vata-Pitta dominant conditions.[21]

Rasasindoor is widely used in the management of chronic ailments such as Rajayakshma (tuberculosis), Kshaya, Jwara, Unmada, Shwasa, Kasa, and various cardiovascular and neurological conditions. Its role as a Yogavahi enhances the bioavailability and targeted action of co-administered drugs. It is often included in composite formulations for its synergy and carrier potential.[22]

The recommended dose of Rasasindoor is typically between 30 to 125 mg per day, depending on the condition and patient's strength (Roga-Bala and Rogi-Bala). It should always be administered with suitable Anupana (vehicle) such as honey, ghee, or decoctions. When properly prepared and purified, it is considered safe. However, improper preparation or overdosage can lead to mercury toxicity, making quality assurance crucial.[23]

Modern studies have revealed that Rasasindoor consists of nano and sub-micron-sized particles, offering greater bioavailability, faster action, and deeper tissue penetration—attributes that support its classical description. Some analytical studies also suggest that it exists in the non-toxic cinnabar (HgS) form, reducing concerns regarding mercury toxicity. Its nanostructure aligns with modern targeted drug delivery mechanisms, validating its classical utility.[24]

Yogavahi Action

The term Yogavahi is derived from two Sanskrit words—Yoga meaning union or combination, and Vahi meaning carrier or bearer. In Rasa Shastra, a Yogavahi substance is defined as one that can carry and enhance the potency of other substances without altering their intrinsic qualities. It is not merely an adjuvant but functions as a selective carrier that guides the active principle to the intended site of action within the body.[25]

According to Rasa Ratna Samuccaya, Parada (mercury) is considered the most exemplary Yogavahi Dravya due to its ability to assimilate, penetrate, and direct the therapeutic action of drugs to Sookshma Srotas (minute channels). The concept highlights how such substances can deeply enter into bodily tissues and enhance the desired effect of co-administered medications, particularly in systemic diseases.[26]

The classical texts describe several attributes that make a substance Yogavahi. These include Teekshna (sharp and penetrating), Sookshma (minute), Vyavayi (spreads quickly throughout the body before digestion), and Ashukari (fast-acting). Additionally, Rasayana (rejuvenative) and Agneya (heat-dominant) qualities contribute to the ability of the substance to reach deeper tissues and act quickly and efficiently.[27]

A Yogavahi substance binds with other drugs, penetrates minute channels (Srotas), and delivers the therapeutic action to specific Dhatus or organs. It acts as a dynamic transporter that not only ensures quick absorption and assimilation but also minimizes the required dose of the main drug, thereby reducing potential side effects. This makes Yogavahi agents highly valuable in multi-targeted therapy, especially in chronic disorders.[28]

In modern pharmacological terms, the concept of Yogavahi can be likened to nanocarriers or drug delivery vehicles that transport active pharmaceutical ingredients directly to target cells or organs. Like liposomes and nanoparticles, Yogavahi substances enhance bioavailability, prolong drug action, and reduce systemic toxicity. This validates the traditional concept through a contemporary scientific lens.[29]

The use of Yogavahi agents allows for the personalization of therapy, targeted action, and synergistic enhancement of drug efficacy. However, such substances must be processed through proper Shodhana (purification) and Marana (incineration) procedures to eliminate toxicity and enhance safety. When used appropriately, Yogavahi action forms a cornerstone of effective Rasaushadhi therapy, offering a sophisticated model of therapeutic precision in classical Ayurveda.[30]

Pharamcological action

Composition and physicochemical profile

- Rasasindoor is a classical Ayurvedic formulation composed of Shuddha Parada (purified mercury) and Shuddha Gandhaka (purified sulphur), prepared via the Kupipakwa method.
- It is primarily a red crystalline form of mercuric sulphide (HgS), known as Cinnabar, which is non-toxic and stable.
- Studies confirm the presence of nano to submicron particles (<100 nm), responsible for enhanced absorption, distribution, and tissue targeting, which are key for cardiovascular interventions.

Table No. 1 Key Pharmacological Properties Related to Hypertension

Ayurvedic Property	Pharmacological Correlate	Relevance in Hypertension
Teekshna	Penetrative action	Aids in endothelial absorption and vascular penetration
Sookshma	Nanoparticle size	Facilitates microcirculation targeting
Vyavayi	Rapid systemic spread	Quick cardiovascular access
Ashukari	Fast-acting pharmacokinetics	Immediate vasodilation support
Rasayana	Cytoprotective and adaptogenic	Reduces oxidative stress and target organ damage
Yogavahi	Bioenhancing drug delivery	Improves action of co-administered antihypertensive drugs

ANTIHYPERTENSIVE MECHANISMS OF ACTION

A. Antioxidant Activity

- Neutralizes reactive oxygen species (ROS), reducing oxidative stress.
- Protects vascular endothelium from damage and dysfunction.

B. Endothelial Protective Action

- Enhances nitric oxide (NO) bioavailability, promoting vasodilation.
- Prevents arterial stiffness and reduces peripheral vascular resistance.

C. Anti-inflammatory Effect

- Suppresses pro-inflammatory cytokines (TNF-α, IL-6), reducing vascular inflammation.
- Attenuates chronic low-grade inflammation implicated in essential hypertension.

D. RAAS Modulation (Probable Action)

- May help inhibit renin-angiotensin system overactivity, reducing fluid retention and vasoconstriction.
- Leads to decreased blood volume and lowered arterial pressure.

E. Neurohormonal Balancing

- Balances autonomic tone by possibly downregulating sympathetic overactivity.
- Supports regulation of heart rate and vascular tone.

F. Cardioprotective Effect

- Improves myocardial efficiency, reduces oxygen demand, and prevents hypertrophy.
- Aligns with classical Hridaya Balya action.

4. Role of Yogavahi Action in Hypertension

- Acts as a bioenhancer—facilitates targeted delivery of Rasayana, Medhya, and Hridya drugs.

- When combined with drugs like Sarpagandha, Arjuna, or Ashwagandha, Rasasindoor increases efficacy and reduces therapeutic dose.
- Enables synergistic, multi-target action: neuroendocrine, vascular, renal, and cardiac.

Safety Profile in Hypertensive Use

- When prepared via Shodhana, Marana, and proper Putapaka methods, Rasasindoor is non-toxic, even at nanodoses.
- The HgS (cinnabar) form is poorly absorbed in toxic doses but highly bioavailable in medicinal nanodoses.
- Toxicological studies suggest no renal or hepatic burden when administered within classical dose limits (30–125 mg/day).

Table No. 2 Clinical Utility and Integration

Use Case	Application of Rasasindoor
Early-stage hypertension	As an adjunct to Rasayana and lifestyle management
Stress-induced hypertension	With Ashwagandha, Jatamansi, or Brahmi to balance neurovascular axis
Resistant hypertension	With Sarpagandha, Arjuna or classical formulations like Hridayarnava Rasa
Cardiac fatigue / dyspnea	For Hridaya Balya and Prana Vaha Srotoshodhana

Modern Research And Nanomedicine Correlation

- Nanoparticle character validated through XRD, TEM, and FTIR studies.
- Suggested biosimilar actions with modern nanocarriers, such as liposomes or solid lipid nanoparticles.
- Highlights Ayurveda's futuristic insight in formulating effective, low-dose, organ-targeted therapies

Yogavahi Action Of Rasasindoor In Essential Hypertension

Rasasindoor, a classical Rasaushadhi, is renowned in Ayurveda for its Yogavahi property—its ability to carry and potentiate the effects of co-administered drugs to target tissues. In the management of essential hypertension, where multi-targeted, organ-specific, and systemic action is required, Rasasindoor offers a unique mode of action by facilitating precise therapeutic delivery and enhancing bioavailability.[31]

Table No. 3 Key Yogavahi Properties Relevant To Hypertension

Property	Ayurvedic Meaning	Relevance in Hypertension
Teekshna	Penetrating	Reaches deep tissues like Dhamanis and Hridaya
Sookshma	Minute and subtle	Penetrates microchannels, affecting endothelial and vascular structures
Vyavayi	Spreads before digestion	Rapid systemic distribution
Ashukari	Fast-acting	Quick action on elevated blood pressure
Rasayana	Rejuvenative, restorative	Protects target organs, reduces oxidative stress

Mechanism Of Action In Essential Hypertension

- **Drug Targeting and Modulation:**
  Rasasindoor, due to its Yogavahi nature, acts as a carrier for co-administered antihypertensive or Rasayana drugs. It helps them reach specific organs involved in hypertension such as the heart (Hridaya), arteries (Dhamani), and brain (Majjavaha Srotas).[32]
- **Vascular Relaxation:**
  By modulating nitric oxide pathways and reducing vascular resistance, it facilitates vasodilation, one of the key objectives in controlling blood pressure.[33]
- **Antioxidant Activity:**
  The nano-structured nature of Rasasindoor helps in free radical scavenging, thereby reducing oxidative stress—a major contributor to endothelial dysfunction in hypertension.[34]
- **Neurohormonal Regulation:**

It assists in balancing autonomic tone and regulating components of the renin-angiotensin-aldosterone system (RAAS), reducing systemic vasoconstriction and fluid retention.[35]

- **Enhancement of Rasayana Effects:**
  When administered with Rasayana herbs like Brahmi, Ashwagandha, or Sarpagandha, Rasasindoor amplifies their adaptogenic and cardioprotective effects.[36]

Outcomes in Hypertension Management

- ↓ Peripheral vascular resistance
- ↓ Blood pressure (systolic & diastolic)
- ↑ Tissue perfusion
- ↓ Target organ damage (heart, kidney, retina, brain)
- ↑ Therapeutic efficacy with reduced dose

Fig No. 1 Yogavahi Action on Essential Hypertension

RESULTS AND FINDINGS

1. **Enhanced Bioavailability Confirmed**
   - Rasasindoor, due to its Sookshma and Vyavayi Gunas, was found to significantly enhance the bioavailability of co-administered substances.
   - Its nanoparticle nature facilitates fast absorption and systemic distribution, aligning with modern drug delivery principles.
2. **Yogavahi Action Validated Conceptually and Pharmacologically**
   - The review confirms that Rasasindoor exhibits true Yogavahi action by carrying therapeutic agents directly to target sites without altering their properties.
   - Acts as a bioenhancer and site-specific carrier, similar to modern nanocarriers.
3. **Antihypertensive Potential Evident**
   - The pharmacological review showed that Rasasindoor has multiple actions beneficial in essential hypertension:
     - Endothelial protection

- Reduction of oxidative stress
- Anti-inflammatory effects
- Possible modulation of neurohormonal activity (RAAS and sympathetic system)

4. **Cardioprotective and Vasodilatory Effects Noted**
    - Literature suggests its ability to:
        - Support myocardial tissue (Hridaya Balya)
        - Promote nitric oxide release for vasodilation
        - Prevent vascular remodeling and stiffness
5. **Safety and Stability Validated When Properly Prepared**
    - When Rasasindoor is prepared using classical Shodhana and Kupipakwa methods, it is non-toxic, stable, and safe in therapeutic doses.
    - Toxicological concerns are negligible with cinnabar form (HgS) and regulated dosing.
6. **Supports Integrative Management of Hypertension**
    - Rasasindoor, with its multi-targeted action and synergistic potential, can be effectively combined with herbs like Sarpagandha, Ashwagandha, Arjuna to enhance outcomes.
    - Offers a holistic solution for long-term blood pressure regulation with Ayurvedic principles.

DISCUSSION

Essential hypertension is a chronic and progressive disorder that arises from complex interactions among genetic, environmental, and neurohormonal factors. Modern pharmacological agents primarily aim at symptom control and hemodynamic regulation but often fall short in addressing the root cause or offering holistic recovery. In contrast, Ayurveda proposes a systems-based approach, emphasizing equilibrium among Doṣas, Dhātus, and Srotas. Within this framework, Rasasindoor—a classical Rasaushadhi—offers a unique model through its Yogavahi property, which harmonizes well with modern concepts of targeted and efficient drug delivery.[37]

The pathophysiology of essential hypertension involves systemic vascular resistance, endothelial dysfunction, oxidative stress, and sympathetic overdrive. Rasasindoor, prepared via Kupipakwa method, is known to possess Teekshna, Sookshma, Vyavayi, Ashukari, and Rasayana attributes, enabling it to penetrate deep Srotas and reach target organs like the heart, vessels, and brain. When administered with suitable Anupanas or co-formulations, it not only potentiates their effects but also directs them to the afflicted tissues, thereby reducing peripheral resistance and protecting against target organ damage.[38]

Scientific investigations have shown that Rasasindoor consists of nano- to submicron-sized particles, contributing to its rapid absorption and high tissue affinity. Its antioxidant activity helps neutralize reactive oxygen species, which are major contributors to endothelial damage and vascular remodeling in hypertension. In addition, its influence on nitric oxide pathways and probable modulation of the renin-angiotensin system suggests a strong pharmacodynamic relevance to blood pressure control. These modern pharmacological interpretations validate the classical claims of its fast action and subtle tissue targeting.[39]

Clinically, Rasasindoor finds a promising place when used alongside botanicals like Sarpagandha, Arjuna, and Ashwagandha, especially in neurogenic or stress-exacerbated hypertension. Its adaptogenic and Rasayana qualities offer neuroendocrine balancing, cardiac protection, and systemic rejuvenation. Moreover, its Hridaya Balya action, as per Ayurvedic classics, correlates with myocardial protection and improved circulatory dynamics. Its use in regulated doses and under expert supervision makes it a valuable tool in chronic hypertension care within integrative medicine protocols.[40]

Overall, Rasasindoor exemplifies how ancient Ayurvedic pharmaceutics foresaw principles now central to modern nanomedicine and bioenhanced drug delivery. Its Yogavahi action supports efficient, low-dose, tissue-specific therapy with minimal toxicity. The conceptual foundation and pharmacological efficacy of Rasasindoor in essential hypertension pave the way for future translational research, including pharmacokinetics, clinical trials, and standardization for safe global application in hypertension management.[41]

CONCLUSION

Rasasindoor, through its unique Yogavahi property and multifaceted pharmacological actions—such as antioxidant, endothelial protective, vasodilatory, and neurohormonal modulatory effects—emerges as a potent and scientifically plausible Ayurvedic intervention for essential hypertension. Its nano-structured form ensures targeted delivery and enhanced bioavailability of co-administered drugs, aligning with modern principles of precision medicine. When prepared authentically and used judiciously, Rasasindoor offers a safe, effective, and integrative therapeutic option that addresses not only the symptomatic control of hypertension but also its deeper pathophysiological origins, supporting long-term cardiovascular health and systemic balance.

Conflict of interst –nil
Source of support – none

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