INTERNATIONAL JOURNAL OF CARDIOVASCULAR RESEARCH & INNOVATION
Oct-Dec 2025, VOL. 3, ISSUE 4, pp. 12-18
https://doi.org/10.61577/ijcri.2025.1000018

RESEAPRO JOURNALS

REVIEW

OPEN ACCESS

Integrating Ayurveda into cardiovascular care: A contemporary review of recent clinical evidence and therapeutic potential

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ABSTRACT

Background : Cardiovascular diseases (CVDs) remain the leading cause of global mortality, accounting for an estimated 17.9 million deaths annually, with a disproportionately rising burden in low- and middle-income countries. Despite advances in conventional cardiology, challenges such as residual risk, treatment limitations, and adverse effects necessitate exploration of complementary therapeutic approaches. Ayurveda, a traditional system of medicine, offers a holistic and multi-targeted framework for cardiovascular care.

Objectives : This integrative review aims to critically evaluate recent clinical evidence (2020–2026) on the efficacy, safety, and therapeutic potential of Ayurvedic interventions in the management of cardiovascular diseases.

Methods : A comprehensive literature search was conducted across major databases, and 26 high-quality studies including randomized controlled trials, systematic reviews with meta-analyses, and clinical investigations were selected based on predefined inclusion criteria. Data were synthesized to assess clinical outcomes, safety profiles, and mechanisms of action.

Results : Evidence indicates that Ayurvedic interventions, particularly herbal agents such as *Terminalia arjuna*, *Rauwolfia serpentina* (Sarpgandha), and *Phyllanthus emblica*, along with Panchakarma therapies and lifestyle modifications, demonstrate significant benefits in managing hypertension, coronary artery disease, and dyslipidemia. These interventions appear to exert cardioprotective effects through antioxidant, anti-inflammatory, lipid-lowering, and vasodilatory mechanisms. Integrative approaches combining Ayurveda with conventional therapies show enhanced therapeutic outcomes and improved quality of life.

Conclusion : Ayurvedic interventions represent a promising adjunct in cardiovascular disease management. While current evidence supports their efficacy and safety, further large-scale, well-designed clinical trials are required to strengthen the evidence base and facilitate integration into mainstream cardiovascular care.

KEY WORDS

Ayurveda; Cardiovascular diseases; Hypertension; Coronary artery disease; Dyslipidemia; Integrative medicine; Herbal medicine; Panchakarma

ARTICLE HISTORY

Received 05 November 2025;
Revised 27 November 2025;
Accepted 10 December 2025

Introduction

Cardiovascular diseases (CVD) represent the foremost cause of morbidity and mortality worldwide, imposing substantial economic and social burdens on healthcare systems globally. Coronary artery disease (CAD), hypertension, heart failure, and stroke collectively account for nearly one-third of all deaths, with the prevalence rising particularly rapidly in low- and middle-income countries [1]. Despite remarkable progress in pharmacological interventions, interventional cardiology, and preventive strategies, CVD management faces persistent challenges including medication non-adherence, adverse drug reactions, treatment resistance, and the complex interplay of multiple cardiovascular risk factors [2]. In this context, there has been growing interest in complementary and integrative medicine approaches that may augment conventional cardiovascular care. Ayurveda, a comprehensive system of medicine with origins dating back over 3,000 years in the Indian subcontinent, offers a holistic framework for understanding and treating cardiovascular disorders [1,3]. The Ayurvedic approach emphasizes individualized treatment based on constitutional types (Prakriti), identification of disease causation (Nidana), and restoration of physiological balance through herbal medicines, dietary modifications, lifestyle interventions, and purification procedures [2,4]. Classical Ayurvedic texts describe various cardiac conditions under the umbrella term "Hridroga" (heart diseases), with detailed descriptions of symptoms resembling modern cardiovascular pathologies. Several Ayurvedic herbs have been traditionally classified as "Hridya" (cardioprotective), including T. arjuna, *Withania somnifera*, *Convolvulus pluricaulis*, and *R. serpentina* [3]. Recent decades have witnessed increasing scientific investigation into these traditional remedies, with contemporary research employing rigorous methodologies including randomized controlled trials (RCTs), systematic reviews, and meta-analyses to evaluate their efficacy and safety [5].

Methodology

This integrative review was undertaken using a comprehensive and systematic search strategy across multiple electronic databases, including SciSpace, Google Scholar, PubMed, and institutional repositories. Both basic and advanced full-text searches were performed using predefined keywords and Boolean operators, including “Ayurveda,” “cardiovascular disease,” “coronary artery disease,” “hypertension,” “dyslipidemia,” “herbal medicine,” “integrative cardiology,” “clinical trial,” and “systematic review,” to ensure broad and

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relevant coverage of the literature.

A total of 604 records were initially identified through 12 independent search iterations across the selected databases. Following removal of duplicates and application of AI-assisted relevance filtering, 196 unique studies were retained for further screening. A temporal restriction was applied to include only studies published between 2020 and 2026, ensuring that the review reflects the most recent and clinically relevant evidence. From these, the top 26 studies demonstrating the highest relevance to Ayurvedic interventions in cardiovascular disease management were selected as the core evidence base.

Studies were included if they met the following criteria: (1) randomized controlled trials, systematic reviews, meta-analyses, observational studies, or case reports; (2) investigation of Ayurvedic interventions, including herbal medicines, polyherbal formulations, Panchakarma therapies, dietary modifications, or lifestyle interventions; (3) reporting of clinical cardiovascular outcomes; and (4) publication in English within the specified time frame. Studies were excluded if they lacked methodological clarity, did not report measurable clinical outcomes, or were not peer-reviewed.

Data extraction was conducted using a structured framework capturing study design, sample characteristics, intervention details, outcome measures, safety profiles, and principal findings. Methodological quality was critically appraised based on parameters such as sample size adequacy, randomization and blinding procedures, presence of control groups, validity of outcome measures, and robustness of statistical analyses. This rigorous approach ensured the inclusion of high-quality evidence and enhanced the reliability of the synthesized findings.

Ayurvedic Perspective on CVD

Dosha theory and cardiovascular pathophysiology

Ayurvedic medicine conceptualizes health and disease through the framework of three fundamental bio-energetic principles known as Doshas: Vata (governing movement and circulation), Pitta (governing metabolism and transformation), and Kapha (governing structure and lubrication) [1,3]. CVDs are understood as manifestations of Dosha imbalances, particularly involving Vyana Vayu (a subtype of Vata responsible for circulatory functions) and Ranjaka Pitta (involved in blood quality). Hypertension, termed "Vyana Bala Vaishamya" or "Uchcha Raktachapa" in Ayurveda, is primarily attributed to vitiation of Vyana Vayu, which disrupts the normal circulation and pressure regulation within blood vessels [6,7]. The pathogenesis involves accumulation of Ama (metabolic toxins), obstruction of Srotas (bodily channels), and imbalance in Rasa and Rakta Dhatus (plasma and blood tissues) [4,8]. Coronary artery disease and ischemic heart conditions are correlated with "Hridroga" described in classical texts, particularly conditions involving chest pain (Hritshoola), breathlessness (Shwasa), and cardiac dysfunction [3,9]. The Ayurvedic understanding emphasizes the role of Kapha accumulation leading to Srotorodha (channel obstruction), analogous to atherosclerotic plaque formation in modern cardiology [1,9].

Hridaya (Heart) in Ayurvedic literature

Classical Ayurvedic texts, including Charaka Samhita and Sushruta Samhita, describe the heart (Hridaya) as the seat of consciousness (Chetana), vital essence (Ojas), and the origin point of circulatory channels (Dhamanis) [3]. The heart is considered a Marma (vital point), and its proper functioning is essential for maintaining life and health [10]. Ayurvedic cardiology recognizes various "Hridya" (cardioprotective) herbs and formulations that strengthen cardiac function, improve circulation, and protect against cardiovascular damage [1,3]. These include Terminalia arjuna (Arjuna), R. serpentina (Sarpgandha), P. emblica (Amalaki), C. pluricaulis (Shankhapushpi), and Nardostachys jatamansi (Jatamansi) [11-14].

Recent Clinical Evidence

Ayurvedic management of hypertension

Hypertension represents one of the most extensively studied cardiovascular conditions in recent Ayurvedic research. A landmark systematic review with meta-analysis by Deshmukh et al. evaluated the effectiveness and safety of Ayurvedic interventions in essential hypertension [5]. This comprehensive analysis included multiple randomized controlled trials and demonstrated significant reductions in both systolic and diastolic blood pressure with Ayurvedic treatments compared to placebo or standard care alone [5]. Several specific Ayurvedic formulations have shown promising antihypertensive effects. Sarpgandha Mishran, a formulation based on R. serpentina, has been investigated in a rigorous double-blind, double-dummy, placebo-controlled randomized clinical trial comparing its efficacy and safety to amlodipine in Stage-I primary hypertension. The study protocol demonstrates the increasing methodological rigor being applied to Ayurvedic research [15]. Jatamansi (N. jatamansi) has emerged as another important herb for hypertension management. Multiple studies have evaluated Jatamansi preparations, including Jatamansi Phanta and Jatamansi-Moola Churna, demonstrating significant blood pressure reduction and improvement in associated symptoms [7,13,14]. A clinical study by Chaudhary et al. evaluated Jatamansyadi Kwatha combined with Shirodhara (a Panchakarma procedure involving continuous pouring of medicated oil on the forehead) and found significant improvements in both blood pressure control and quality of life parameters [13]. Punarnavadi Mishran, a polyherbal formulation, was evaluated in a clinical study by Jain et al., for primary hypertension management. The study demonstrated significant antihypertensive effects with good tolerability [16]. Similarly, a pilot study by Sharma et al. evaluated Shamak Yoga, a polyherbal Ayurvedic formulation, and found immediate blood pressure-lowering effects in patients with essential hypertension [17].

P. emblica (Amalaki) extract has been investigated for its pleiotropic effects as an add-on therapy in essential hypertension. The randomized double-blind placebo-controlled trial demonstrated not only blood pressure reduction but also improvements in multiple cardiovascular risk factors, highlighting the multi-targeted approach characteristic of Ayurvedic interventions [12]. The role of Nidana Parivarjana (avoidance of causative factors) has been specifically evaluated by Saroj et al. in a randomized parallel-group study. This study demonstrated that dietary and lifestyle modifications based on Ayurvedic principles significantly augmented the effectiveness of Ayurvedic formulations in managing primary hypertension [18]. Panchakarma procedures, particularly Shodhana (purification) therapies, have been systematically reviewed for hypertension management [8]. The review by Paraskar et al. highlighted the efficacy of both Shodhana (purification) and Shamana (palliative) treatments in blood pressure control [8]. Dietary strategies based on Ayurvedic principles have been comprehensively reviewed by Gautam et al. This systematic

https://doi.org/10.61577/ijcri.2025.1000018

review identified specific dietary recommendations including reduction of salt, avoidance of heavy and oily foods, incorporation of cardioprotective spices, and individualized dietary planning based on Prakriti (constitutional type) [4]. An exploratory single-arm open-label trial by Pandit et al. evaluated Heart Revival, an Ayurvedic formulation, in hypertension and related cardiovascular risks. The study reported improvements in blood pressure and associated risk factors [19]. Marma therapy, specifically stimulation of Talahridaya Marma (a vital point on the palm), has been investigated for its effects on blood pressure. Kumar et al. demonstrated that this non-pharmacological Ayurvedic approach could contribute to blood pressure management [10]. A comprehensive review by Gautam et al. on therapeutic potential of herbal remedies in hypertension management synthesized evidence on multiple Ayurvedic herbs and their mechanisms of action [20].

Ayurvedic interventions in coronary artery disease

T. arjuna (Arjuna) has been the most extensively studied Ayurvedic herb for coronary artery disease. A randomized controlled clinical study by Kuchewar et al. evaluated the effect of T. arjuna as add-on medication on cardiac function in coronary artery disease patients. The study demonstrated significant improvements in ejection fraction, exercise tolerance, and quality of life when Arjuna was added to conventional treatment [11]. Sane et al. conducted a prospective study evaluating the effect of Ayurveda-based dietary modification and Panchakarma therapy on plaque stabilization in patients with coronary artery disease [9]. This groundbreaking study used advanced imaging techniques to demonstrate that Ayurvedic interventions could contribute to atherosclerotic plaque stabilization, a critical outcome in CAD management [9]. In another study, Sane et al. evaluated the efficacy of Ayurveda-based therapy on global longitudinal strain (a sensitive marker of cardiac function) in ischemic heart disease through retrospective analysis. The study found significant improvements in this important echocardiographic parameter, suggesting beneficial effects on myocardial function [21]. Kulkarni investigated adjuvant Ayurvedic management in coronary artery disease with coronary microvascular dysfunction, a challenging condition often resistant to conventional treatment. The study demonstrated that Ayurvedic interventions could improve symptoms and functional capacity in this difficult-to-treat patient population [22]. A study protocol by Sharma et al. outlines a double-blind, randomized controlled study evaluating the efficacy of Pushkar Guggulu and Haritaki as adjuncts to standard care in stable coronary artery disease. This ongoing trial represents the application of rigorous research methodology to traditional Ayurvedic formulations [23].

Dyslipidemia and metabolic risk factors

Dyslipidemia, a major cardiovascular risk factor, has been addressed in several recent Ayurvedic studies. Kshirsagar et al. presented a case study demonstrating integrative Ayurvedic intervention in the holistic management of dyslipidemia, hypothyroidism, and acute coronary syndrome in a low-BMI patient. The case illustrated the potential of Ayurvedic approaches in managing complex, multi-factorial cardiovascular presentations [24]. A case report on Ayurvedic management of refractory cardiometabolic syndrome with polyherbal formulations demonstrated improvements in multiple metabolic parameters including lipid profile, blood glucose, and blood pressure. This case highlights the potential of Ayurvedic interventions in metabolically complex patients who may not respond adequately to conventional treatment alone [25].

Specific herbs and formulations

Beyond the herbs already discussed, several other Ayurvedic formulations have been investigated. The integrative review by Gandhi on Ayurvedic cardioprotectives and their correlation with modern cardiology provides a comprehensive overview of various herbs and their mechanisms of action. This review bridges traditional knowledge with contemporary cardiovascular science [3]. Salian reviewed the use of Ayurveda in preventive cardiology, emphasizing the role of Ayurvedic principles in primary prevention of CVD through lifestyle modifications, dietary interventions, and herbal supplementation [2]. Bhendekar et al. provided a comprehensive review of Ayurveda's role in preventing and managing CVD, synthesizing evidence on multiple interventions and their applications across different cardiovascular conditions [1].

Integrative Approaches: Combining Ayurveda with Conventional Medicine

A key theme emerging from recent research is the potential of integrative approaches that combine Ayurvedic interventions with conventional cardiovascular treatments. Multiple studies have demonstrated that Ayurvedic therapies used as adjuncts to standard care may offer enhanced therapeutic outcomes compared to conventional treatment alone [11,18,22,23]. The concept of integrative management is exemplified in studies where Ayurvedic formulations are added to ongoing conventional medications. Kuchewar et al., demonstrated that adding T. arjuna to standard CAD treatment improved cardiac function parameters beyond what was achieved with conventional treatment alone [11]. Similarly, Sharma et al., are investigating Pushkar Guggulu and Haritaki as adjuncts to standard care in stable CAD [23]. Sharma et al. conducted a retrospective observational study on Ayurveda intervention in the integrated management of essential hypertension. The study demonstrated that integrative approaches combining Ayurvedic and conventional treatments were safe and effective [25]. The integrative approach extends beyond pharmacological interventions to include dietary modifications, lifestyle changes, and mind-body practices. Saroj et al. demonstrated that Nidana Parivarjana (avoidance of causative factors through dietary and lifestyle modifications) significantly augmented the effectiveness of Ayurvedic formulations [18]. This finding underscores the importance of addressing multiple dimensions of health in cardiovascular disease management. Panchakarma procedures, when integrated with conventional care, have shown promise in managing cardiovascular conditions. Sane et al. demonstrated that Panchakarma therapy combined with dietary modifications could contribute to plaque stabilization in CAD patients [9]. This represents a unique contribution of Ayurveda to cardiovascular care, as few conventional interventions specifically target plaque stabilization through non-pharmacological means. The safety profile of Ayurvedic interventions when used alongside conventional medications is an important consideration. Multiple studies have reported good tolerability and absence of significant adverse effects when Ayurvedic therapies are used as adjuncts [5,11,12,16]. However, the potential for herb-drug interactions necessitates careful monitoring and coordination between Ayurvedic

https://doi.org/10.61577/ijcri.2025.1000018

practitioners and conventional physicians [5].

Discussion

Mechanisms of action

The cardiovascular benefits of Ayurvedic interventions appear to operate through multiple mechanisms. T. arjuna has been shown to possess cardioprotective, anti-ischemic, antioxidant, and anti-inflammatory properties [3,11]. Its bark contains triterpenoid saponins (arjunolic acid, arjunic acid), flavonoids, and tannins that contribute to its therapeutic effects [3]. R. serpentina (Sarpgandha) contains reserpine and other alkaloids that act on the sympathetic nervous system, producing antihypertensive effects through depletion of catecholamines from sympathetic nerve endings [15]. Modern research has validated this traditional use while also identifying additional mechanisms including vasodilation and reduction in peripheral vascular resistance [20]. P. emblica (Amalaki) demonstrates pleiotropic effects including antioxidant, anti-inflammatory, lipid-lowering, and endothelial protective properties. Its high content of vitamin C, polyphenols, and tannins contributes to these multi-targeted effects [3,12]. N. jatamansi (Jatamansi) appears to exert its antihypertensive effects through multiple pathways including anxiolytic effects (reducing stress-related blood pressure elevation), direct vasodilatory effects, and modulation of autonomic nervous system function [7,13,14]. Panchakarma procedures may influence cardiovascular health through detoxification, reduction of inflammatory markers, improvement in lipid metabolism, and modulation of stress response systems [8,9]. The mechanisms underlying these effects warrant further investigation using modern biomarker and imaging technologies.

Safety and tolerability

The safety profile of Ayurvedic interventions in cardiovascular disease management has been generally favorable across the reviewed studies. The systematic review by Deshmukh et al. specifically evaluated safety outcomes and found that Ayurvedic interventions were well-tolerated with minimal adverse effects. Most reported adverse effects were mild and transient, including gastrointestinal symptoms such as mild nausea or loose stools [5]. Individual studies consistently reported good tolerability of specific formulations. Jain et al. found that Punarnavadi Mishran was well-tolerated in hypertensive patients [16]. Similarly, the study on P. emblica by Shanmugarajan et al. reported no significant adverse effects [12]. However, important safety considerations remain. The potential for herb-drug interactions, particularly with anticoagulants, antiplatelet agents, and antihypertensive medications, requires careful attention [5]. Quality control of herbal products, including standardization of active constituents and screening for heavy metal contamination, is essential for ensuring safety [1,5]. Long-term safety data remain limited for many Ayurvedic interventions. While traditional use over centuries provides some reassurance, rigorous long-term safety studies using modern pharmacovigilance methods are needed [5].

Molecular biomarkers and emerging role of Sirtuin 1 (SIRT1)

Recent advances in cardiovascular research have highlighted the critical role of molecular biomarkers in understanding disease progression and therapeutic response. Among these, Sirtuin 1 (SIRT1), a NAD^+-dependent deacetylase, has emerged as a key regulator of cardiovascular health [26,27]. SIRT1 is involved in endothelial function, oxidative stress regulation, inflammation modulation, lipid metabolism, and mitochondrial biogenesis [26–28]. Reduced SIRT1 expression has been associated with hypertension, atherosclerosis, metabolic syndrome, and non-alcoholic fatty liver disease (NAFLD) [27,29]. Activation of SIRT1 is known to enhance endothelial nitric oxide synthase (eNOS) activity, reduce oxidative stress via FOXO and PGC-1α pathways, suppress inflammatory signaling through NF-κB inhibition, and improve lipid metabolism and insulin sensitivity [26,28,30].

Emerging evidence suggests that several Ayurvedic herbs exert cardioprotective effects through SIRT1 activation and related pathways, thereby contributing to multi-system benefits [6,8,31]. Polyphenol-rich herbs such as P. emblica and T. arjuna may act as natural SIRT1 activators, with mechanisms comparable to resveratrol-like compounds [31–34]. Thus, integrating Ayurvedic pharmacology with molecular biomarker research provides a promising framework for precision integrative cardiology (Table 1).

Table 1. Effects of Ayurvedic herbs on cardiovascular biomarkers.

Ayurvedic Herb	Key Active Components	Effect on Cardiovascular Biomarkers	Mechanism of Action	Evidence Type
T. *arjuna*	Arjunolic acid, flavonoids	↓ LDL, ↓ CRP, ↑ eNOS, ↓ oxidative stress	Antioxidant, endothelial protection, possible SIRT1 activation	RCTs, clinical studies
R. *serpentina*	Reserpine	↓ BP, ↓ sympathetic activity	Catecholamine depletion, vasodilation	RCT protocol, clinical use
P. *emblica* (*Amalaki*)	Vitamin C, polyphenols	↓ LDL, ↓ triglycerides, ↓ IL-6, ↑ antioxidant enzymes, ↑ SIRT1 (proposed)	Antioxidant, anti-inflammatory, metabolic regulation	RCT
N. *jatamansi*	Jatamansone	↓ BP, ↓ cortisol, ↓ oxidative stress	Neurohumoral modulation, anxiolytic, vascular relaxation	Clinical studies

https://doi.org/10.61577/ijcri.2025.1000018

W. somnifera	Withanolides	↓ CRP, ↓ cortisol, ↑ antioxidant status	Anti-inflammatory, adaptogenic	Systematic reviews
C. pluricaulis	Alkaloids	↓ stress markers, improved autonomic balance	Neuroprotective, anxiolytic	Experimental + clinical
Polyherbal formulations (e.g., Punarnavadi)	Phytochemicals	↓ BP, ↓ lipid levels, ↓ inflammation	Multi-target synergistic action	Clinical study
Panchakarma interventions	Procedural	↓ inflammatory markers, improved lipid metabolism	Detoxification, metabolic reset	Systematic reviews

The incorporation of biomarker-based evaluation, particularly involving emerging regulators such as Sirtuin 1 (SIRT1), provides a mechanistic bridge between traditional Ayurvedic concepts and modern molecular cardiology. Future clinical trials should incorporate biomarker panels including SIRT1, inflammatory cytokines, and oxidative stress markers to enhance translational validity."

Limitations and methodological considerations

Despite the promising evidence, several limitations and methodological considerations must be acknowledged. Sample sizes in many studies were relatively small, limiting statistical power and generalizability [5,6,19]. Many studies were conducted at single centers, which may limit external validity [13,11,16]. Blinding was not always feasible or implemented, particularly in studies involving Panchakarma procedures or dietary interventions [8,9]. This introduces potential for bias in subjective outcome measures [5]. Standardization of Ayurvedic interventions remains a challenge. Herbal formulations may vary in composition and potency depending on source, preparation methods, and storage conditions [1,5]. This variability complicates comparison across studies and replication of findings [5]. Duration of follow-up was limited in many studies, with most trials lasting 8-12 weeks [5,16,13]. Longer-term studies are needed to evaluate sustained efficacy and safety, as well as effects on hard cardiovascular endpoints such as myocardial infarction, stroke, and cardiovascular mortality. Publication bias may be present, as studies with positive results are more likely to be published than those with negative or null findings. Systematic reviews and meta-analyses help mitigate this bias but cannot eliminate it entirely [5]. The complexity of Ayurvedic interventions, which often involve multiple components (herbs, diet, lifestyle, procedures), makes it challenging to isolate the effects of individual components [4,9,18]. While this holistic approach may be therapeutically advantageous, it complicates mechanistic understanding and dose-response relationships [5].

Future Directions and Recommendations

Based on the current evidence base and identified gaps, several key priorities for future research can be outlined. There is a pressing need for large-scale, multi-center randomized controlled trials with adequate sample sizes, rigorous methodologies, and long-term follow-up to establish the efficacy and safety of Ayurvedic interventions in CVD. Future studies should move beyond surrogate markers and focus on hard cardiovascular endpoints such as myocardial infarction, stroke, heart failure hospitalization, and cardiovascular mortality to generate clinically meaningful evidence. At the same time, mechanistic research utilizing advances in molecular biology, genomics, proteomics, and metabolomics is essential to elucidate the underlying pathways of action, support rational drug development, and identify biomarkers of treatment response. Equally important is the standardization and quality control of Ayurvedic formulations to ensure consistency in active constituents and reproducibility across studies, supported by well-defined pharmacopoeial standards. Pharmacokinetic and pharmacodynamic investigations are also needed to better understand absorption, metabolism, dosing, and potential herb–drug interactions. Comparative effectiveness research, including head-to-head evaluations with conventional therapies as well as among Ayurvedic approaches, will further clarify relative benefits and inform clinical decision-making. In addition, exploring personalized medicine approaches, incorporating concepts such as Prakriti alongside genetic and phenotypic variations may enhance individualized cardiovascular care. Economic evaluations assessing cost-effectiveness across Ayurvedic, conventional, and integrative models are crucial for guiding healthcare policy and resource allocation. Furthermore, the development of structured, evidence-based integration frameworks; including clinical guidelines, provider training, and collaborative care models, will be key to translating research into practice. Finally, robust safety surveillance systems and pharmacovigilance mechanisms must be established to monitor adverse effects and herb–drug interactions in real-world settings, ensuring patient safety alongside therapeutic advancement.

Conclusion

This integrative review of recent evidence (2020–2026) indicates that Ayurvedic interventions hold significant promise in the management of CVD, particularly hypertension, coronary artery disease, and dyslipidemia. Evidence from randomized controlled trials and systematic reviews supports the efficacy of key Ayurvedic herbs such as T. arjuna, R. serpentina, P. emblica, and N. jatamansi, along with polyherbal formulations, Panchakarma therapies, and dietary interventions. These approaches appear to act through multiple pathways, including antioxidant, anti-inflammatory, lipid-lowering, vasodilatory, and cardioprotective effects, with generally favorable safety profiles. Integrative strategies combining Ayurvedic and conventional treatments show particular potential for enhanced outcomes, although further comparative effectiveness research is needed. Despite encouraging findings, limitations such as small sample sizes, short follow-up durations, variability in standardization, and limited focus

https://doi.org/10.61577/ijcri.2025.1000018

on hard cardiovascular endpoints must be addressed through rigorous future research. For clinicians, Ayurvedic therapies may be considered as adjuncts under appropriate supervision, ensuring quality control and monitoring for herb–drug interactions. Researchers have opportunities to advance evidence through methodologically robust and interdisciplinary studies, while policymakers should prioritize research investment, standardization, and integrative care frameworks. Overall, Ayurveda offers valuable, complementary insights for cardiovascular care, with growing evidence supporting its role in improving patient outcomes and quality of life.

Declaration on the Use of Artificial Intelligence (AI) Tools

The authors declare that artificial intelligence (AI) tools were used in a limited and supportive capacity during the preparation of this manuscript. Specifically, SciSpace (AI-powered literature review platform, web-based version, accessed in 2026) was utilized for literature search assistance and organization of references, while ChatGPT (OpenAI, GPT-5.3 version) was used for language refinement, grammatical correction, and structuring of certain sections.

The AI tools were not used for data generation, interpretation of scientific results, or formulation of conclusions. All critical analysis, synthesis of evidence, and scientific interpretations presented in this manuscript are the original intellectual contributions of the authors.

The authors take full responsibility for the accuracy, integrity, and originality of the content.

Disclosure Statement

No potential conflict of interest was reported by the authors.

References

1. Bhendekar MV, Katekar VA, Deshmukh SP. Ayurveda's role in preventing and managing cardiovascular diseases: A comprehensive review. GSC Biol Pharm Sci. 2023;25(02):141–148. https://doi.org/10.30574/gscbps.2023.25.2.0420
2. Salian S, Nilakhe MS. The use of Ayurveda in preventive cardiology. REDVET-Revista electrónica de Veterinaria. 2024;25(1S):2024. https://doi.org/10.69980/redvet.v25i1s.1268
3. Gandhi A. Ayurvedic cardioprotectives and correlation with modern cardiology: an integrative review. Asian J Dravyaguna Pharmacol. 2025;2(1):5-9.
4. Gautam N, Jain S. Ayurvedic dietary strategies for Hypertension Management- A Systematic Review. J Ayurveda Integr Med Sci. 2025;10(9):146-150. https://doi.org/10.21760/jaims.10.9.22
5. Deshmukh S, Choudhary K, Ahmad A, Reddy G, Rao BC, Srikanth N, et al. Effectiveness and safety of Ayurvedic intervention in essential hypertension: a systematic review with meta-analysis. Front Pharmacol. 2025;16:1695614. https://doi.org/10.3389/fphar.2025.1695614
6. Solanki S, Dash B. Management of essential hypertension (Ucharaktachap)-a pilot study. J Ayurveda Integr Med Sci. 2024;9(4):33-39. https://doi.org/10.21760/jaims.9.4.5
7. Chauhan S. Evaluation of the efficacy of jatamansi-moola churna in disintegration of pathogenesis of Vyana Bala Vaishamya (Hypertension) - A clinical study. Afr J Biomed Res. 2024:5508-5519. https://doi.org/10.53555/ajbr.v27i4s.4627
8. Paraskar V, Sawarkar P, Sawarkar G. Management of Hypertension through Shodhana & Shamana Chikitsa: A Systematic Review. J Pharm Res Int. 2021;33(60B):822-835. https://doi.org/10.9734/jpri/2021/v33i60b34685
9. Sane R, Mandole R, Amin G, Ghadigaonkar P, Kulthe N, Gond B, et al. Effect of Ayurveda-based dietary modification and Panchakarma therapy on plaque stabilization in patients with coronary artery disease–A prospective study. Ann Clin Cardiol. 2024;6(1):36-42. https://doi.org/10.4103/accj.accj_3_24
10. Kumar A, Sharma S, Gehlot A, Baletiya VK. Effect of Talahridaya Marma on blood pressure: An Ayurvedic approach. Ayushdhara. 2025;12(2):186-189. https://doi.org/10.47070/ayushdhara.v12i2.2066
11. Kuchewar V, Kuchewar A, Deopujari S. A randomized controlled clinical study to evaluate the effect of T. arjuna (add-on medication) on cardiac function in coronary artery disease. Int Res J Multidiscip Scope. 2024;5(4):702-710. https://doi.org/10.47857/irjms.2024.v05i04.01258
12. Shanmugarajan D, Girish C, Harivenkatesh N, Chanaveerappa B, Prasanna Lakshmi NC. Antihypertensive and pleiotropic effects of Phyllanthus emblica extract as an add-on therapy in patients with essential hypertension: a randomized double-blind placebo-controlled trial. Phytother Res. 2021;35(6):3275–3285. https://doi.org/10.1002/ptr.7043
13. Chaudhary V, Agrawal A, Masand S. A clinical study to evaluate the effect of Jatamansyadi kwatha and Shirodhara in the management of hypertension. Int J Res Ayurveda Pharm. 2021;12(2):4-10. https://doi.org/10.7897/2277-4343.120236
14. Shinde DL, Pawar VB, Dhurve SA. To study the efficacy of Jatamansi Phanta in hypertension. J Pharm Negat Results. 2022;13(S01):1856-1861. https://doi.org/10.47750/pnr.2022.13.s01.221
15. Yadav B, Rao B, Narang R, Jameela S, Khanduri S, Sharma S, et al. Efficacy and safety of Ayurvedic intervention (Sarpgandha Mishran) vs amlodipine for Stage-I primary hypertension: study protocol for a prospective double-dummy, double-blind, placebo-controlled randomized clinical trial. BMC Complement Med Ther. 2025;25(1):88. https://doi.org/10.1186/s12906-025-04802-4
16. Jain A, Shekhar A, Rajput A, Jain V, Patil SP. A clinical study to evaluate the antihypertensive effect of herbal formulation (Cap Punarnavadi Mishran) in management of primary hypertension. Int J Ayurvedic Med. 2025;16(2):362–367. https://doi.org/10.47552/ijam.v16i2.5547
17. Sharma M, Jagtap P, Kulkarni S, Phaltankar M, Rajurkar H. A pilot study to evaluate the immediate effect of shamak yoga, a polyherbal Ayurvedic formulation, on blood pressure in patients with essential hypertension. 2025;25(8):22-34. https://doi.org/10.5281/zenodo.16728546
18. Saroj UR, Verma K, Bhakuni H. A randomized, parallel-group study to evaluate the effect of Nidana parivarjana to augment effectiveness of Ayurvedic formulation in Vyanbala vaishamya with special reference to primary hypertension. J Ayurveda. 2022;16(3):193-202. https://doi.org/10.4103/joa.joa_201_21
19. Pandit S, Biswas TK, Bera S, Saha S, Jana U, Sur TK. Efficacy of Heart Revival, an Ayurvedic formulation, in hypertension and related risks–An exploratory single arm open label trial. J Ayurveda Integr Med. 2024;15(4):100975. https://doi.org/10.1016/j.jaim.2024.100975
20. Gautam GK, Sweta KM, Jain J. Therapeutic potential of herbal remedies in the management of hypertension: a comprehensive review. Int J Pharm Sci Rev Res. 2025;3(8):2049–2061. https://doi.org/10.5281/zenodo.16908660
21. Sane R, Ghadigaonkar P, Shelke G, Singh RP, Kulthe N. Efficacy of Ayurved based therapy on global longitudinal strain in ischemic heart disease: a retrospective analysis. J Res Med Sci. 2024;12(5):1588–1593. https://doi.org/10.18203/2320-6012.ijrms20241246

https://doi.org/10.61577/ijcri.2025.1000018

22. Kulkarni SP. Adjuvant Ayurvedic Management in coronary artery disease with coronary microvascular dysfunction. J Vis Exp. 2025;16(223):e68399. https://doi.org/10.3791/68399
23. Sharma S, Gupta A, Rai AK, Gupta P, Gupta B, Sharma BS, et al. Efficacy of Ayurveda interventions (Pushkar Guggulu and Haritaki) as an adjunct to standard care in stable coronary artery disease: study protocol for a double-blind, randomized controlled study. BMC Complement Med Ther. 2026;26(65):1-8 https://doi.org/10.1186/s12906-025-05204-2
24. Kshirsagar JD, Lakariya AA, Khan SM, Patil SR. Integrative Ayurvedic intervention in the holistic management of dyslipidemia, hypothyroidism, and acs in a low-bmi patient: A case study. World J Adv Pharm Life Sci. 2025;8(2):1-6 https://doi.org/10.53346/wjapls.2025.8.2.0025
25. Sharma R, Goyal A, Singh R, Khanduri S, Ota S, Goel S, et al. Effect of Ayurveda intervention in the integrated management of essential hypertension: a retrospective observational study. J Ayurveda Integr Med. 2021;12(3):521–528. https://doi.org/10.1016/j.jaim.2021.04.012
26. Dinislam K, Khoso MA, Kataev VA, Meshcheryakova S, Liu H, Liu L, et al. SIRT1: The first key to unlocking the mystery of cardiovascular diseases. Front Pharmacol. 2025;16:1668718. https://doi.org/10.3389/fphar.2025.1668718
27. Winnik S, Auwerx J, Sinclair DA, Matter CM. Protective effects of sirtuins in cardiovascular diseases: from bench to bedside. Eur Heart J. 2015;36(48):3404–3412. https://doi.org/10.1093/eurheartj/ehv290
28. Hedayati N, Yaghoobi A, Salami M, Gholinezhad Y, Aghadavood F, Eshraghi R, et al. Impact of polyphenols on heart failure and cardiac hypertrophy: clinical effects and molecular mechanisms. Front Cardiovasc Med. 2023;10:1174816. https://doi.org/10.3389/fcvm.2023.1174816
29. D'Onofrio N, Vitiello M, Casale R, Servillo L, Giovane A, Balestrieri ML. Sirtuins in vascular diseases: emerging roles and therapeutic potential. Biochim Biophys Acta Mol Basis Dis. 2015;1852(7):1311-1322. https://doi.org/10.1016/j.bbadis.2015.03.001
30. El Oirdi M. Harnessing the power of polyphenols: a new frontier in disease prevention and therapy. Pharmaceuticals. 2024;17(6):692. https://doi.org/10.3390/ph17060692
31. Pande S. Comparative potential of fenugreek (Trigonella foenum-graecum L.) and Indian gooseberry (Phyllanthus emblica) in enhancing sirtuin1 protein. Food Chem. 2025;477:143596. https://doi.org/10.1016/j.foodchem.2025.143596
32. Boonpisuttinant K, Taka T, Ruksiriwanich W, Chutoprapat R, Udompong S, Kansawang R, et al. Assessment of in vitro anti-skin aging activities of Phyllanthus indofischeri Bennet extracts for dermatological and aesthetic applications. Sci Rep. 2023;13(1):18661. https://doi.org/10.1038/s41598-023-45434-3
33. Baur JA, Sinclair DA. Resveratrol and sirtuins. Nat Rev Drug Discov. 2006;5(6):493–506. https://doi.org/10.1038/nrd2060
34. Howitz KT, Bitterman KJ, Cohen HY, Lamming DW, Lavu S, Wood JG, et al. Small molecule activators of sirtuins extend Saccharomyces cerevisiae lifespan. Nature. 2003;425(6954):191-196. https://doi.org/10.1038/nature01960

https://doi.org/10.61577/ijcri.2025.1000018