



(REVIEW ARTICLE)



Ayurveda's role in preventing and managing cardiovascular diseases: A comprehensive review

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Abstract

In recent years, lifestyle changes, heavy diets, and environmental shifts have led to a notable increase in the prevalence of cardiovascular diseases (CVDs). Hridroga, the collective term for heart-related illnesses in Ayurveda, has become increasingly common as a result. CVDs encompass a wide range of heart and blood vessel disorders, including coronary heart disease, heart attacks, cerebrovascular diseases such as stroke, hypertension, peripheral artery disease, rheumatic heart disease, congenital heart disease, and heart failure. Ayurveda attributes heart-related disorders primarily to imbalances in the three doshas, and restoring their equilibrium poses a complex challenge in treating CVDs.

Herbal remedies have played an integral role in human healthcare throughout history, with various traditional medical systems employing them for treating numerous ailments. Ayurveda stands as one of the oldest and globally recognized traditional systems of medicine. This review paper explores the pivotal role of Ayurveda in preventing, managing, and assessing CVDs through interventions related to diet (Ahara), lifestyle (Vihara), seasonal routines (Ritucharya), yoga, daily routines (Dinacharya), and rejuvenation therapies (Rasayana).

The paper sheds light on how Ayurveda's holistic approach addresses the root causes of CVDs, offering valuable insights into preventive strategies, lifestyle modifications, and herbal interventions. By synthesizing traditional knowledge with contemporary scientific understanding, this review aims to provide a comprehensive perspective on the potential of Ayurveda in combating the rising burden of cardiovascular diseases in modern society.

Keywords: Cardiovascular Diseases; Ayurveda; Herbal Remedies; Holistic Approach

1. Introduction

Ayurveda is a traditional system of medicine it is the most common form of medicine used in India. The word ayurveda originates from the two words that are ayur and Vedas, ayur means life and vedas means knowledge[1][2][3]. The basic concept of Ayurveda is based on a group study of the body (sharia) sense organs (indriyas) mind (Manas)and soul (Atman) balance of these components is related to health. When imbalances occur among them they give birth to several disorders in the human body such as cardiovascular diseases in ayurveda suggests a treatment for all of these diseases and the treatment in Ayurveda is the combination of food, exercise, meditation, and herbs.in Ayurveda, there are several plants and the formulation is beneficial in treatment of the heart diseases[4] The word Hrudaya in Ayurveda itself designates the function of the very important organ the body Hru means attraction of the blood from the body and Da means donation which means full words. There are several pieces of evidence are available which prove the usefulness of various ayurvedic drugs in the treatment of cardiovascular diseases. the clinical study states that arjuna

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is in congestive heart failure, chronic stable angina, and hypertension. The arjuna and its constituents like arjunolic acid show a cardioprotective effect due to antioxidant activity in rats. Alcoholic extract of the bulb of *Allium ascalonicum* shows a beneficial effect on protolytic and hypocholesterolemic activity in rabbits. Rhizome of *Curcuma longa* Linn (turmeric) and its constituent curcumin possess a hypolipidemic effect, antiatherosclerotic action, and antithrombotic effect. In recent times studies state that the natural components successfully prevent, control, and block important cardiovascular disease factors such as oxidative stress and inflammatory mediators. Medicinal plants have been useful in patients having congestive heart failure, systolic hypertension, angina pectoris, atherosclerosis, cerebral insufficiency, and venous insufficiency.[5][6] The aqueous fluid that circulates in the body is known as the Rasa it is always flowing through the body Rasa circulates in the body this rasa circulates in the body like the wheel of a vehicle sushruta states that the Nutrients fluid flows around the body with a severe velocity. similar to the speed of light, water, and Sound. Bhela states that the nutrients and fluid come into circulation from the heart and spread all over the body Through siras. For the prevention of cardiovascular diseases, an herbal polypill can be developed by Incorporating ayurvedic herbs such as Guggulu, Arjuna, Pushkarmoola, Lasuna, Amalaki, and Jatamansi for Managing risk factors of cardiovascular diseases.

In Ayurveda also performing Suryanamaskara have plays a remarkable role in prevention of the heart diseases.[7] In a survey conducted by the global burden of disease study it was found that the majority of deaths are caused worldwide due to cardiovascular diseases these surveys were conducted in the year 2010. It is also predicted that by the year 2030 deaths occurring due to cardiac arrest are raised to 24 million of the world population. Accordance to research by WHO was That 80% of the world's population depends upon natural products and traditional forms of medicine for treating any disease.[8] The widely used plants such as Ginkgo biloba, Ginseng, and Ganoderma lucidum, extract of these herbs are employed in ayurvedic formulations for the management of numerous heart diseases such as myocardial ischemia, hypertension, coronary heart disease, Herbal extract, and their components have a remarkable contribution in the management of hypertension, or atherosclerosis these two are mainly responsible for the cardiovascular diseases incidences. Herbal remedies have several bioactive and due to these, they have multimodal cellular mechanisms of action. Herbal remedies have antioxidant, vasorelaxant, anti-inflammatory, and diuretic effects. Herbal remedies also inhibit endothelial dysfunction, platelet activation, lipid peroxidation, ROS production, and macrophage atherogenicity.[9] Astragalus membranaceus contains an Astragaloside which is a major constituent used as an antioxidant and for the protection against ischemic-associated cardiovascular diseases. a membranous extract controls the cardiac function by improving energy metabolism and inhibiting the production of free radicals in a myocardial ischemia in a reperfusion rat model. *Allium sativum* is a classic example of an herb used in the treatment and management of cardiovascular diseases it has numerous benefits against cardiovascular disease incidence such as hypertension, oxidative stress, hyperlipidemia inflammation. Decreasing the cholesterol and the level of LDL reduces the content of lipids in the arterial cells and due to this reason it is beneficial in management of the atherosclerosis and hyperlipidemia.[10]



Figure 1 Brahmi

2. Cardiovascular system

The heart is a muscular organ with the size of a closed fist situated in the chest between The lungs beyond the sternum and above the diaphragm. It is lined by the pericardium. On its upper-level end, the base of the heart is attached to the aorta, pulmonary arteries And veins, and the vena cava. The lower level tip of the heart, known as the apex, rests just Superior to the diaphragm.[11] The base of the heart is situated along the body's center line with the apex pointing toward the left side. Because the heart points to the left, about 2/3 of the heart's mass is found on the left side of the body, and the other 1/3 is on the right. The heart is the pump that is responsible for accommodating the exact circulation

of oxygenated blood around the vascular network of the body. It takes in deoxygenated blood. Through the veins transfer it to the lungs for oxygenation before pumping it into an artery. [12]

Cardiovascular diseases

Cardiovascular diseases are several health conditions that affect the circulatory system, including the heart, and capillaries cardiovascular diseases are the general term that describes the diseases of the heart and blood vessels. blood flow through the heart is reduced because of the

- Blood clots (thrombosis)
- Hyperlipidemia

Due to this, the narrowing of the artery takes place and this results in atherosclerosis.[13]

2.1. Hypertension

Following the ayurveda hypertension is generally a pitta condition. because of the poor blood flow. It is a Vata type and the Kapha are included in it due to the congestion, with phlegm clogging decreasing the flow of the blood to the heart. and in a normal point of view, hypertension is a chronic medical condition that arises when the blood pressure is hypertension is a chronic medical condition that arises when the blood pressure is abnormally high (greater than 140 mm of Hg systolic and 90 mm of Hg diastolic). hypertension occurs when the body's smaller blood vessels (the arterioles) narrow, causing the blood to exert excessive pressure against the vessel walls and forcing the heart to work harder to maintain the pressure. Although the heart and blood vessels can tolerate increased blood pressure for months and even years, eventually the heart may enlarge (a condition called hypertrophy) and be weakened to the point of failure.

2.2. Traditional Ayurvedic remedies for the treatment of hypertension

By departing the etiological factors are the first line of management of hypertension Ayurveda focuses firstly on how the disease is prevented. In the management of hypertension, ayurveda accentuates nonpharmacological methods such as the proper diet plan and lifestyle changes in a lot of chapters In classical texts like Dinacharya Adhyaya, Ritucharya Adhyaya., Navegannadharniya Adhyaya, etc are specifically devoted to a healthy lifestyle, decreasing the body weight, stopping smoking, a completely healthy diet and the regular exercise are advice by mostly by the physician to the patient,s suffering from hypertension at the time of treatment of hypertension, the Prasanna avastha of all tri doshas and saptdhatu are taken into consideration. [14]

2.2.1. Ahara (Diet)

The proper diet is given to the patient suffering from mild hypertension for the prevention of moderate hypertension. Accordance with the Aacharya Charaka consumption of the lavana for prolonged intervals is the major etiological factor for hypertension. Overconsumption of sodium chloride damages several tissues and the arteries. A nutritional diet that involves fresh fruits and grains, consuming low-fat food avoiding fast food and excessive sugar in daily diet, and most importantly alcohol consumption [14]

2.2.2. Vihara

Decreasing stress is a significant factor in the management of hypertension. regularly doing, Meditation, and other exercises resulting in the reduction of stress. Upvasa (fasting), performing pranayam, and Surya namaskar, are also helpful in treating hypertension. Chanting of the Gayatri mantra or the Omkara jap also plays a significant role in the treatment of hypertension. Shavasana, Sukhasana Dhanurasana, Makarasana, and Vajrasaan play a crucial role in decreasing blood pressure in hypertensive patients as well as in normal individuals. [15]

2.2.3. Vata hypertension

- These hypertension are caused due to stress and the worryness.
- Excess workload, anxiety, and the insomnia
- And numerous nervous system disorders. [16]

2.2.4. Kapha hypertension

- This hypertension occurs due to the excess fat that is obesity,

- Tiredness
- High cholesterol present in the body
- Edema

2.2.5. *Pitta hypertension*

- These are hypertension related to the liver disorder
- Deposition of the internal heat[17][18]

2.3. Herbal remedies for the treatment of hypertension

2.3.1. *Brahmi*

Synonyms: Kapotvadka ,Somvalli, Saraswati

Family: Scrophulariaceae

- Rasa- Tikta,katu
- Guna- Laghu, Ruksha
- Vipaka- Katu
- Virya- Ushna
- Karma- Kapha Vata

Classification

- Kingdom: Plantae
- Order: Lamiales
- Genus: Bacopa

Chemical constituents: Brahmin and herpestine alkaloids

Brahmi is significant in maintaining the normal blood pressure in our body and is also Brahmi helpful for increasing the utilization of nitric acid and normal vascular functions. In one animal Bacopa monnieri decreases both systolic and diastolic blood pressure. N-nitro-L-argininemethylation causes chronic hypertension in rats, and due to this it reduces blood pressure. [19]

2.3.2. *Bhringraja*

- Synonyms:-: Markava, Keshraja,ravipriya, keshraja bhungrah
- Family:- Asteraceae
- Rasa:- Katu, Tikta
- Guna:- Laghu, Ruksha
- Vipaka:- Katu
- Virya:- Ushna
- Karma:-Kaphavataghna
- Parts used: -Whole plant and seeds
- Botanical name:-Eclipta alba

Chemical constituents:- The main component of the eclipta alba are the coumestan derivative like wedololactone[1.6%], dimethylwedololactone, desmethyl-wedololactone-7glucoside, and other constituents are ecliptic, β -amyrin, luteolin-7-O-glucoside, hen-triacontanol, heptacosanol, stigmasterol. However, the bioactive Components used in the treatment of hypertension are ecliptine and wedololactone.

Use:- Bhringraja is used in the management of hypertension. It controls the raised blood pressure. The formulation used in the treatment of hypertension is bhringraja juice For normal blood pressure two teaspoons of leaves of bhringraja and honey mix in it and administered twice a day.[20][21]



Figure 2 Bhringraja

2.3.3. *Vacha*

- Synonyms: Uragandha, Shadgrantha, Golomi.
- Family: Araceae
- Rasa- Katu, Tikta
- Guna- Laghu, Tikshna
- Vipaka- Katu
- Virya- Ushna
- Karma- Kaphavataghna

Vacha is an important medicinal plant used in Ayurveda traditional medicine to treat different ailments and maintain health conditions. Vacha is a strongly aromatic gregarious perennial herb, with a close set distichously ritual, set.



Figure 3 Vacha

Use:- Hypertension is produced in rats by closing the left renal artery for 4 hours. Animals were anesthetized with ketamine (50 mg/kg) at the end of the experiment. The carotid artery was cannulated and bound to a pressure gauge. A blood pressure convey is a device that determines blood pressure. Acorus ethyl acetate extract was shown to be effective. Calamus rhizomes (EAAC) treated hypertensive rats showed considerable improvement. When compared to the control group, systolic and diastolic blood pressure were remarkably lower. [19]

2.3.4. *Sarpagandha*

- Synonyms: Dhawala Vitapa, Chandramara, Sarpasugandha, Sarpagandhakhya.
- Family: Apocynaceae
- Rasa- Tikta
- Guna- Ruksha
- Vipaka- Katu
- Virya- Ushna
- Karma- Kapha Vata Shamaka

- Parts used: Root

Classification

- Kingdom:-Plantae
- Clade:-Tracheophytes
- Clade:-Angiosperms
- Order:-Gentianales
- Family:- Apocynaceae
- Subfamily:-Rauvolfoidea
- Tribe:-Vinceae
- Subtribe:-Rauvolfiinae

Chemical constituents:- Commonly sarpagandha contain indole alkaloids the most significant bioactive component present in the sarpagandha is reserpine, it is isolated from *R.serpentina* gives remarkable effect in useful in the treatment of hypertension Ajmalicine, ajmalicine, reserpine, margarine, serpentine, serpentine,



Figure 4 Sarpagandha

Use:- It is significantly used in the treatment of hypertension. The bioactive agents present in it show the antihypertensive action. The powder of roots of the sarpagandha helps in reducing systolic and diastolic blood pressure by administered the dose 1.3-2 .gm. [22]

3. Myocardial ischemia

A cardiac impairment that results from an imbalance between the supply and demand of blood in the myocardium is known as ischemic heart disease (IHD), which can be either an acute or chronic condition. IHD and the alternative term coronary artery disease (CAD) are used interchangeably. Based on the frequency and severity of coronary artery disease. One of four syndromes may appear as a result of the cardiac reaction and constriction.

- Chest pain from angina pectoris,
- An acute myocardial infarction,
- Congestive heart failure and chronic ischemic heart disease Unexpected cardiac death

4. Traditional ayurvedic remedies for treatment of myocardial ischemia

4.1. Arjunaristha

It fortifies the heart's muscles, prevents blood artery plaque from forming, and guards against atherosclerosis. It includes Guda or jaggery, Dhataki Pushpa (*Woodfordia fruticosa*), Maghuka Pushpa (*Madhuca indica* flowers), and Arjuna tvak (*Terminalia arjuna* bark).[23]

4.2. Arjunkhirpak

It can aid in the treatment of angina, high cholesterol, and blood pressure control. It contains arjuna red bark powder, cow milk, water, and sugar.[24][25]

4.3. Akikpishti

This tonic is used to treat hypertension as well as rapid or irregular heartbeats. In addition, Hearts are stronger. It includes cow's milk, rose water, aloe vera juice, and the agate gemstone akik stone.

4.4. Triphalaguggulu

This plant improves heart health and decreases cholesterol. It includes Guggulu (Commiphora mukul), Hareetaki (Terminalia chebula), Vibheetaki (Terminalia bellerica), and Amla (Embllica officinalis).[26]

Ashwagandhachurna

It is used to treat ischemic cardiomyopathy, excessive blood pressure, and coronary artery disease treatments for myocardial ischemia using Ayurveda.

5. Conclusion

Ayurveda has given novel remedies for the treatment, prevention, and management of heart diseases. Several herbs are used in the treatment of heart disease. Herbs such as arjuna, garlic, and cinnamon with their formulation play significant roles in the management of cardiovascular diseases. Guggul is effective in atherosclerosis and also helpful in hyperlipidemia. The detailed study of the herbs and their bioactive components for their pharmacological effect will help in the development of advanced molecules to treat cardiovascular diseases. Herbs play a significant role in the treatment of disease and due to this, they gained popularity. Herbs have a lot of side effects compared to synthetic medicine. More clinical studies are required about the phytochemicals, efficacy, safety, and toxicity of the medicinal plant.

Compliance with ethical standards

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There is no conflict of interest between the author.

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