
Heart Diseases and their Ayurvedic Management

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Abstract

Good health is a sign of good physical and mental health. Physical health can be measured by proper functioning of all body parts. Heart is central body organ that works unceasingly till death. Nowadays, heart problems are not only associated with old, aged people but young people are encountering them too. In present world, unhealthy lifestyle, stressful conditions, genetic and many other things are triggering cardiovascular problems. These problems can be managed by living a natural and healthy lifestyle. From ancient time, different plant parts are being used to treat different diseases. Plants contain huge variety of phytochemicals that provide immunity to body. Various heart ailments can be treated using available knowledge of traditional Indian medicines; moreover, complications can be minimized with ayurvedic practices. This chapter highlights various medicinal plants and their phytochemicals that are useful to treat and manage cardiovascular diseases.

Keywords

Cardiovascular diseases, Blood pressure, Medicinal plants

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1. Introduction

A healthy heart is a sign of a healthy body. Cardiovascular diseases (CVDs) accounts for the primary cause of health issues. According to the reports of a survey done in 2010 by Global Burden of Disease Study, CVDs are the major cause of death (around 29.6%) worldwide (Vanhecke et al. 2006). Also, it is speculated that with the ever-increasing cases, estimated deaths due to heart diseases by the year 2030, will be higher than 24 million of the current population. Furthermore, in a review in The American Journal of the Medical Sciences (issue October 2020), it was reported that the Covid-19 patients along with underlying heart diseases have high mortality rate between 10.5 to 14 percent. Heart diseases can cause life threatening conditions if not treated timely. Heart ailments can be cured naturally if we manage to live a healthy and balanced life.

On closely studying the epidemiological data's, it was found that consumption of good quantity of fruits and herbs was closely related to a decrease in the risk of CVD (Ludwig 2002; WHO 2000). Ayurvedic remedies have been used since ages for curing and preventing CVDs. Since old times it is well established that the ayurvedic remedies, plant extracts and herbal medicines have been continued to be a major source of curing health concerns. In research conducted by World Health Organization it was reported that about 80% of world the population depends on natural products and herbal medicines for curing health ailments and conditions (Vasan 2002).

The word Ayurveda is combination of two Sanskrit words 'Ayus' and 'Veda' meaning science of life. In Ayurveda, Heart or Hridya is described as one of the 'Dashapranayatan' and also as a 'mahat' means important organ of the body and it works 24×7 from time of birth till death (gatiman) (Asgary et al. 2014). Hridya is given major importance by Ayurvedic scholars and have also been elaborated on Hridyarogas (cardiovascular disease) in much detail along with their treatment. Coronary Artery Disease (CAD) is one of the cardiovascular diseases. CAD is known to affect Indians at a higher frequency and also at quite younger age than their counterparts in other developed countries as well as many other developing countries (Ness and Powles 1997).

In Ayurveda, diseases are categorized as Agantuk (Adventitious), Sharirika (Physical), Manasika (Mental), and Swabhavik (Natural). Ayurvedic scholars cited drugs used for treating *Hridroga* (heart disease). Charaka popularized about ten drugs

within *Hridya Mahakashaya* group that comprises mostly of ascorbic acid present in citrus fruits. It has been reported that some phytoconstituents found in the above herbs aids in maintaining the blood vessels including coronary arteries in a healthy state. Heart diseases are categorized according to *Doshika* dominance and *Krimi*. It appears to be very difficult to incorporate all the cardiovascular conditions described by modern medical science into these varieties. An analytical investigation of the herbal lore used in the control of *Hridroga* like Arjuna (*Terminalia arjuna* [Roxb.] Wight and Arn.), Pushkarmoola (*Inula racemose* Hook. f.), Bala (*Sida cordifolia* Linn.), Nagabala (*Sida humilis* Linn.), Pippali (*Piper longum* Linn.), Yashtimadhu (*Glycyrrhiza glabra* Linn.), Haritaki (*Terminalia chebula* Retz.) and Dashmoola, etc., clearly demonstrate that they are equipped with hypocholesteremic, anti-platelet, hypotensive and thrombolytic activities which play important role in the management of cardio-vascular and cerebrovascular disorders.

2. Types of Heart Diseases

2.1. Atherosclerosis: Atherosclerosis refers to the thickening/hardening of the artery wall. During this condition, the walls of the arteries deposit cholesterol and have large number of smooth muscle cells making the vessels narrow. The exact mechanism by which thickening occurs is not understood but it has been reported that smoking, hypertension, high cholesterol levels, diabetes and various other processes escalate this process (Du Bose et al. 2000). Atherosclerosis painlessly destroys the cardiovascular system progressively leading to complete obstruction of the artery lumen.

2.2. Coronary artery spasm: In this heart disease, an abrupt constriction is observed in the smooth muscles of coronary artery causing vasoconstriction. Its causes are not well known but it gets triggered by stress, consumption of alcohol and smoking.

2.3. High blood pressure: High blood pressure, also known as hypertension, occurs when pressure of the blood in the arteries is routinely higher than the usual, reflecting that the muscles of heart are working harder to pump the blood. Symptoms of high blood pressure are not observed until major organ damage. It causes multiple problems like heart attack, stroke, brain hemorrhage and even kidney failure. The consistent pressure causes arteriosclerosis and then results in heart attack. The high pressure on the cerebral arteries (that carries blood supply to the brain) results in the weakening and then rupture of the artery causing brain hemorrhage (Kearney et al. 2005; Murray and Lopez 1996).

2.4. Peripheral Arterial Disease (PAD): PAD is a type of atherosclerosis in which the arteries in legs, lower abdomen, arms, kidney, and neck are constricted and obstructed causing difficulty in walking.

2.5. Heart attack: During this condition, the coronary artery is blocked by clot or plaque which results in blocking of blood supply to a part of heart. If this condition persists for few minutes, the part of heart muscle begins to die (Josh et al. 2007).

2.6. Heart failure: In this condition, the heart fails to pump blood efficiently, creating the body deficient in blood or oxygen. Pulmonary congestion (fluid in lungs) and oedema (swelling of legs, ankles, and feet) are common symptoms of heart failure (WHO 2002; Law et al. 2003).

3. Ayurvedic Management

Ayurvedic herbs and herbal compounds /remedies play important role in management of heart diseases. Some of the herbs showing effectiveness against heart ailments are discussed below:

3.1. *Allium sativum* (Common name: Garlic): Since quite a long time, garlic is used to treat various cardiovascular ailments like higher lipid concentration in the blood. It leads in the production of nitric oxide which causes vasodilation and relaxation of smooth muscles (Reinhart et al. 2008). Allicin, the major active constituent of garlic has been reported to show variety of benefits. Garlic is found to reduce high blood pressure and it has been reported in various studies that it significantly reduces increased systolic pressure (Ried et al. 2008).

3.2. *Annona muricata* (Common name: Prickly custard apple): This fruit species is known for its edible fruits. Its leaf extract has been shown to decrease the increased blood pressure by reducing the circumferential vascular resistance (Hasrat et al. 2004).

3.3. *Apium graveolens* (Common name: Celery): Celery juice when consumed with equal quantity of honey is reported to control blood pressure. Its seeds have been found to be effective in reducing high blood pressure (Gharooni and Sarkarati 2000).

3.4. *Avena sativa* (Common names: Green oat): Regular consumption of whole oats reported in reduction of lipid content, control of blood pressure and hence helps in prevention of cardiovascular diseases. A diet consisting of whole oats which are rich in dietary fiber can greatly decrease the requirement of anticonvulsant medication (Burke et al. 2001; Keenan et al. 2002).

3.5. *Boerhaavia diffusa* (Common name: Punarnava): The root extract of *B. diffusa* is potentially utilized for the treatment of heart ailments. It is known to cleanse blood

and provide strength to the cardiac muscles. It works as an antistress compound which lowers elevated cortisol and blood pressure (Gaitonde et al. 1974; Thakur et al. 1989).

3.6. *Camellia sinensis* (Common name: Tea): Drinking tea serves many health benefits. Although, the views on the benefits of tea in managing blood pressure are contradictory but green tea has been shown to reduce the risk of hypertension (Yang et al. 2004).

3.7. *Carum copticum* (Common name: Ajwain): This is commonly used in Indian cooking. Experimental data suggests that its crude extract reduces elevated heart rate and blood pressure of rats (Gilani and Aftab 1994).

3.8. *Cassia occidentalis* (Common name: Coffee weed): The extract of the leaves of this small plant has been described to show calming effect on heart valves and reduce elevated blood pressure. This extract specifically inhibits Ca^{2+} channels (Ajagbonna et al. 2001).

3.9. *Commelina virginica* (Common name: Virginia dayflower): The plant extract of whole plant of this perennial plant shows relaxation of aortic rings by 15 to 30% in guinea pig (Hasrat et al. 2004).

3.10. *Crataegus pinnatifida* (Common name: Chinese hawthorn): Its berries have been shown to have numerous health effects. It improves hypertension, reduces the fat levels in blood and also used in the treatment of heart failure along with other medicines (Mashour et al. 1998; Bensky and Gamble 1990).

3.11. *Cuscuta reflexa* (Common name: Giant dodder): Plant extract of *C. reflexa* are known to reduce increase blood pressure. The hypertensive activity and production of bronchospasm was found to be dose dependent (Gilani and Aftab 1992).

3.12. *Daucus carota* (Common name: Carrot): It is commonly utilized in treating hypertension. Carrot contains phytoconstituents that might have effects on blood vessels, muscles, and the heart (Gilani et al. 2000b).

3.13. *Desmodium styracifolium* (Common name: Osbeck): Experimental data reveals that stem and dry leaves preparation of osbeck reduces the elevated blood pressure, heart rate and increases coronary circulation (Ho et al. 1989).

3.14. *Emblica officinalis* (Common name: Amla): Amla is widely used for treating cardiovascular ailments. It lowers the cholesterol levels; hence, prevent the formation of plaques in the arteries. It also acts as an antioxidant and removes free radicals and hence acts as a blood purifier (Chaudhuri 2004; Nadkarni 1954).

3.15. *Lavandula stoechas* (Common name: French lavender): Its crude extract shows to reduce elevated blood pressure and heart rate (Gilani et al. 2000a).

3.16. *Linum usitatissimum* (Common name: Linseed, Flaxseed): Flaxseeds are rich in α -linolenic acid (i.e., omega-3 fatty acid) which are known for reducing blood cholesterol levels. They are beneficial in maintaining good heart health, lowering glucose tolerance, and lowering elevated blood pressure. It has also been reported that consumption of ground flaxseed (15 to 50 g) on daily basis reduces total cholesterol and LDL concentrations in the blood serum (Bloedon and Szapary 2004).

3.17. *Lumnitzera racemose* (Common name: Black mangrove): It is a small coastal tree or shrub which is known to have plenty of medicinal benefits. The acetone extract of the plant is known to reduce hypertension and its fruits are used for treating skin disorders, and snake bites (Cheng et al. 1995).

3.18. *Lycopersicon esculentum* (Common name: Tomato): It is commonly used in cooking and its extract is abundant in carotenoids like beta-carotene, lycopene, and vitamin E. These are known for their antioxidant activity (Engelhard et al. 2006).

3.19. *Moringa oleifera* (Common name: Murungai): The experimental studies on both animals and humans have shown the benefits of Murungai leaves in lowering blood cholesterol and hence reducing the risk of cardiovascular diseases. Scientists have chemically analyzed that isothiocyanates are the primary anti-inflammatory compounds present in the leaves, seeds and pods of moringa plant (Faizi et al. 1998).

3.20. *Ocimum basilicum* (Common name: Basil): Basil provides various health benefits in the diet, as herbal medicine, and as an essential oil. Experimental research in rats shows that basil leaves extract reduces increased blood sugar levels and also help in reduction of high blood pressure (Azhar et al. 1995).

3.21. *Phyllanthus amarus* (Common name: Nelanelli): This plant has shown huge health benefits and has been used for over 2,000 years in Ayurvedic medicine. It is used in the treatment of jaundice, diabetes, frequent menstruation, and topical used for treating skin ulcers, swelling, and itchiness. It maintains hypertension and heart health (Amaechina and Omogbai 2007).

3.22. *Punica granatum* (Common name: Pomegranate): Its juice is quite common fruit drink. Experimental data has shown that this fruit reduces high blood pressure by diminishing the angiotensin converting enzymes activity by about 36% (Aviram and Dornfeld 2001).

3.23. *Rauwolfia serpentina* (Common name: Sarpgandha): Rauwolfia alkaloids work by controlling nerve impulses along certain nerve pathways. As a result, they act on the heart and blood vessels to lower blood pressure (Jerie 2007).

3.24. *Sesamum indicum* (Common name: Sesame): Sesame seeds may help reduce heart disease risk factors, including elevated triglyceride and LDL “bad” cholesterol levels. Research in rats suggests that sesame oil may help prevent heart disease and even slow the development of plaque in the arteries. In fact, it may lower your cholesterol levels when used in place of oils high in saturated fats (Nakano et al. 2002).

3.25. *Terminalia arjuna* (Common name: Arjuna bark): It has been reported that certain phytoconstituents like tannins and glycosides found in Arjuna bark possess antioxidant property which safeguards the cardiac muscles and vessels from damaging by free radicals. Arjuna has also shown potential in dilating the blood vessels and dissolving the plaque in the vessel thereby improving the blood flow (Dwivedi and Jauhari 1997).

3.26. *Theobroma cacao* (Common names: Cocoa bean): The cocoa powder is rich in flavonoids which are known for lowering blood pressure and improving blood lipid profile. Dark chocolate intake reduces the risk of various cardiovascular diseases like coronary heart disease, heart failure and heart stroke (Taubert et al. 2003).

3.27. *Uncaria rhynchophylla* (Common name: Cat’s claw herb): Traditionally, this herb is utilized in reducing high blood pressure and to cure a number of neurological symptoms. Its hypotensive activity is due to alkaloid hirsutine which acts at the Ca^{2+} channels (Horie et al. 1992).

3.28. *Viscum album* (Common name: Mistletoe): It has been reported that the leaf extract of this plant shows coronary vasodilator activity (Tenorio et al. 2005).

3.29. *Withania somnifera* (Common name: Ashwagandha): This is most widely used herb for treatment of stress and hypertension. Biochemically, it is made up of alkaloids that are known to have relaxation and rejuvenating effect on cardiovascular muscles (Singh et al. 1982; Mohanty et al. 2008).

3.30. *Zingiber officinale* (Common name: Ginger): Ginger is known to relax smooth muscles and aids in improving blood circulation. It is used quite commonly used in Indian cooking and helps in prevention of cardiovascular ailments (Nicoll and Henein 2009).

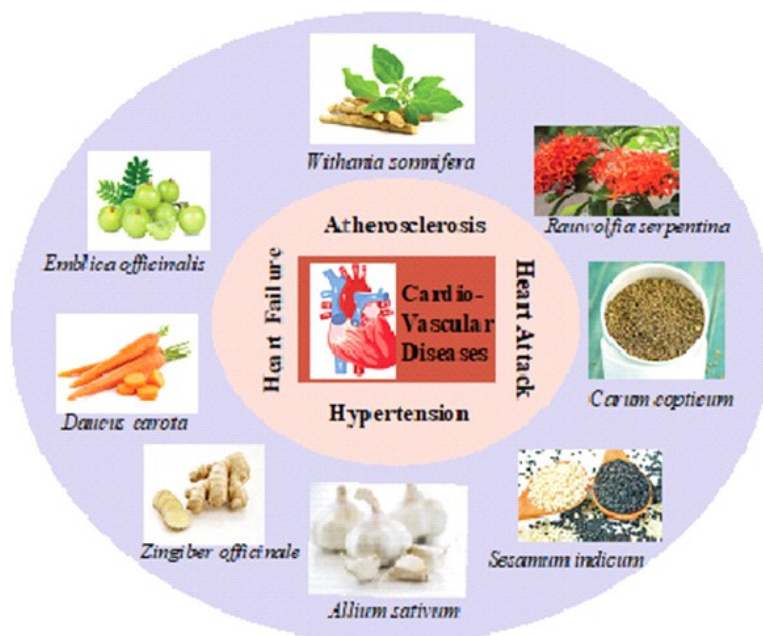


Figure1: Major plants used for cardiovascular diseases

4. Future Perspective

Heart diseases are main cause of sudden death. This disease progresses with time but due to lack of knowledge or ignorance people ignore various early signs. If people become aware about their own body and treat the problem before the complicated stages, then millions of lives can be saved. Adopting a natural way of life with Ayurveda can be very beneficial to save lives. If we apply ancient knowledge of Ayurveda to our daily life, then people could be saved from heart ailments and further complications. Importantly, Ayurvedic treatment is cheap and easily available to everyone, we just need to incorporate in our daily routine. Furthermore, we also need to do research on more phytochemicals and their exact mode of actions.

5. Conclusion

The effects of medicinal plants on human health cannot be ignored. The phytoconstituents present in medicinal plants such as flavonoids, terpenoids, carotenoids have antioxidant activity which can reduce free radicals and hence are effective against hypertension, heart stroke, atherosclerosis, and other heart ailments. The consumption is also important by the effects in protection of cardiovascular

diseases mainly because these diseases are the first cause of death in world. These herbals can be our answer to this deadly disease spreading to all sections of our society. It is important to train the patients to undertake safety and precautionary measures and also avoid random use of herbal medicines. There are a lot of herbs and plants that are known to have role in preventing cardiovascular diseases, improving hypolipidemia, reducing hypertension through antioxidant, hypotensive, anticlotting, vasodilating and anti-atherosclerosis properties. We need to have these plants in our arsenal to fight against this killer disease.

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