

Critical Evaluation of Atherosclerosis in Ayurveda

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Abstract

Atherosclerosis is a chronic inflammatory disease of the arteries in which the lipid rich atheromatous plaque build-up in arterial lumen causing narrowing of the arteries. Symptoms usually arise in the middle age and depends upon the artery involved. It is the leading cause of vascular disease. Its major clinical manifestations are ischemic heart disease, ischemic brain stroke and peripheral artery disease. Almost half of the men by the age of 45 and females by the age of 55 may have atherosclerotic plaque in the arteries. Atherosclerosis is very common over the age of 40 years. Irrespective of sex, average prevalence of peripheral artery disease due to atherosclerosis is 5% in the age group 40 to 49 is 5% and in the age group 70-79 years is 13%. The prevalence of coronary artery disease in India is 21.4% for diabetics and 11% for non-diabetics. CAD is more common in urban parts than rural parts in India. The rate of stroke range 334 – 424/ 100 000 in urban and 84-262/ 100 000 in rural India. The global burden of atherosclerosis and deaths due to its sequel is on the rise. Hence, there is need to trace this entity in Ayurvedic literature and find the safe remedial measures. In the present study, disease atherosclerosis is studied retrospectively in Ayurvedic literature with regard to its pathophysiology, causes, features and the treatment. Atherosclerosis is called as 'Dhamani Pratichaya' in Ayurveda. As per Ayurveda, it is the disease related to over nutrition (Rasa Pradoshaj Vikar) and deposition of lipids in the arteries. It leads to the perfusion deficits in the organ to which the affected artery is supplying. The symptoms depend upon the artery involved. Acharya Sushruta, while describing the nutrition related obesity (Rasa Nimitta Staulya) in chapter 15 of his text Sushrut Samhita, mentioned the pathogenesis of atherosclerosis and its complications. It is observed and concluded that disease atherosclerosis is very well described in ancient Indian medical science, Ayurveda and there is a need to follow the preventive and curative guidelines given in Ayurveda.

Keywords: echocardiography; spectral analysis of a single-channel electrocardiogram

Introduction

Atherosclerosis is the leading cause of vascular disease across the globe. Atherosclerosis is called as 'Dhamani Pratichaya' in Ayurveda. It is a systemic disease. As per Ayurveda, it is the disease related to over nutrition (Rasa Pradoshaj Vikar) and deposition of lipids in the arteries. As per Ayurveda the causes like over eating, lack of exercise, intake of oily, fatty foodstuff and alcoholic beverages are responsible for the development of atherosclerosis. Due to the accumulation of lipid rich material in the arterial lumen, there is incomplete supply of the blood to the organs. The perfusion deficits lead to ischemic or infarction related changes. The symptoms depend upon the artery involved. Acharya Sushruta, while describing the nutrition related obesity (Rasa Nimitta Staulya) in chapter 15 of his text Sushrut Samhita, mentioned the pathogenesis of atherosclerosis and its complications. For e.g. if it cause obstruction in coronaries then it gives rise to Hrit Shoola (Angina). If it causes obstruction in the arteries supplying the testes, then it may lead to Kilaibya (Impotency). The cerebral artery stenosis due to atherosclerosis, eventually may lead to brain stroke. Renal artery

stenosis due to atherosclerosis may lead to renal failure. Ayurveda is of the view that regular exercise, stopping the overeating, avoiding the hyperlipidemic diet, using the millets in diet can prevent the disease. The drugs like Rasanjana, Tamra Bhasma, Medohara Guggulu, Scrapping agents (Lekhan Dravyas and Lekhan Basit) etc can cure the disease.

Review of Literature

Definition of Atherosclerosis As Per Ayurveda

In Ayurveda, Dhamani-pratichaya (Atherosclerosis) is defined as the excessive deposition of layer of fatty sticky unctuous material inside the lumen of arteries. [1]

As per Ayurveda, Dhamni Pratichay is one of the diseases, caused exclusively by the vitiation of Kapha (Kaphaj Nanatamaj Vyadhi). [2]

Hence, the factors, responsible for the vitiation of Kapha, also serves as the aetiological factors for the atherosclerosis in arteries (Dhamni Pratichaya).

Risk Factors of Atherosclerosis As Per Ayurveda

As per Ayurvedic scholars Charaka and Sushruta, following are the risk factors for the development of atherosclerosis. [3] [4]

A] Life Style Related Factors :

Excessive day Sleeping

Lack of Exercise

Laziness

B] Food Related Factors :

a) Food Grains :

Excessive consumption of wheat

Excessive intake of rice

Excessive intake of Grinded products such as floured wheat, maida

Excessive intake of new grains such as new rice, new wheat etc

Excessive intake of mixed preparation of rice and split pigeon pea.

b) Oily Food Product :

Excessive intake of Sesame

Excessive intake of Fat

b) Beans :

Excessive intake of Black gram

Excessive intake of Big black gram

c) Milk products :

Excessive intake of Milk

Excessive intake of Curd

Excessive intake of sweet milk and rice Slurry

d) Sugar products :

Excessive intake of Jaggery

Excessive intake of Sugar

e) Fruits :

Excessive intake of water chestnut (*Scirpus grossus*)

Excessive intake of water Caltrop (*Trapa bispinosa*)

Excessive intake of sweet fruit

Excessive intake of Pumpkin

f) Meats :

Excessive intake of meat of aquatic animals like fish, crocodile etc

Excessive intake of meat of cow, buffalo, goat, sheep etc

g) Alcohol :

Excessive intake of new alcoholic preparation

C] Food Properties Related Factors :

Excessive intake of sweet food items.

Excessive intake of sour food items.

Excessive intake of salty food items.

Excessive intake Consumption of cold food items.

Excessive intake Consumption of sour food items

Excessive intake of food items that are difficult to digest.

Excessive intake of sticky food items.

Excessive intake of food items increasing liquid content of the body.

D] Food Habit Related Factors :

Taking beneficial and harmful food together.

Taking food before the digestion of earlier consumed food.

Pathogenesis of Atherosclerosis As Per Ayurveda

Due to the consumption of risk factors as said above, the Kapha and Meda (fat) increases quantitatively in body. [5]

The function of pathologically increased Kapha is to cause coating, obstruction and hardness in the arterial lumen. [6]

This is further enhanced by the extra deposition of fat in arterial lumen.

Due to this the arterial lumen gets obstructed and area to be supplied, remain under perfused.[7]

As per modern science also due to the consumption of fat rich diet and lack of exercise atheromatous plaque develops in the lumen of arteries which is composed of fat, blood and calcium. This plaque ruptures after some time and platelets starts aggregating there forming thrombus which further occludes the blood vessel. This thrombus may get dislodged and may act as emboli to occlude other vessels.

Features of Atherosclerosis in Arteries

Atherosclerosis is a systemic phenomenon and affects the entire arterial system. The clinical manifestations depend upon the anatomical site, the speed of onset of atheroma, and the rate of formation of collateral supply.

Atherosclerosis in coronary arteries leads to coronary artery disease causing myocardial ischemia, infarction and angina.[8]

Atherosclerosis in cerebral arteries leads to ischemic stroke. [9] [10]

Atherosclerosis in renal arteries leads to renal artery stenosis causing secondary hypertension and renal failure. When increased Kapha and meda gets accumulated in the blood vessels supplying the kidneys, the condition is referred as renal artery stenosis. In ayurveda, its is said that ischemia results due to obstruction or stenosis or blood vessels causing perfusion deficit.

Atherosclerosis in mesenteric arteries leads to intestinal ischemia and mesenteric angina.

Atherosclerosis in peripheral arteries supplying the limbs causes limb ischemia, intermittent claudication in legs. Arms can also be affected reflecting as difficulty in carrying out functions. Symptomatic peripheral artery disease affects the leg eight times more than the arms. In the arms subclavian artery is the commonest site of disease.

Intermittent claudication (khanja) is the most common presentation of the peripheral artery disease affecting the lower limbs. It is characterized by the ischemic pain affecting the muscles of the legs. The pain is usually felt in calf as the superficial femoral artery is commonly affected. Pain may be felt in thighs and buttocks if the iliac arteries are involved. Pain comes on after walking and subsides on resting. Other features such as pallor, pulselessness, coldness and paresthesia of the affected part may be present. SpO2 level is decreased in affected limb.

Critical limb ischemia produces pain at rest and ulceration or gangrene that is present for more than 2 weeks. The patient with severe limb ischemia is at greater risk of losing their limb without early revascularization by angioplasty or stenting. Acute limb ischemia due to thrombus in situ can

easily be treated with intravenous heparin, antiplatelet agents, and high doses of statins. But acute limb ischemia due to embolism results in extensive tissue necrosis within 6 hours unless the limb is urgently revascularized. Irreversible ischemia requires amputation of the affected limb.

Atheroembolism may affect the subclavian arteries in arm. Blue fingers may be the presenting feature of small emboli lodged in digital arteries.

Atherosclerosis in arteries supplying the penis can cause impotency. [11]

Diabetes often co exists with obesity and atherosclerosis. [12]

Investigations

During ancient days there were no technical advances to measure the hyperlipidemic state in laboratory on biochemical parameters nor there were imaging techniques. They use to diagnose it on the basis of features like enlarged tummy, gluteus, breasts, exertional dyspnea etc. Today investigations like lipid profile can be done to detect hyperlipidemic state. Similarly, the imaging techniques like coronary angiography (CAG) provides the extent of blockage. Intra arterial digital subtraction angiography (IA-DSA) can be used to see the perfusion deficit in cerebral arteries. Colour Doppler USG of limbs can be done to know the peripheral blockages.

Differential Diagnosis

1] Berger's Disease

2] Raynaud's Disease

Treatment Of Atherosclerosis In Ayurveda

The Ayurvedic scholars Charaka and Sushruta have suggested following line of treatment for atherosclerosis. [13] [14] [15] [16] [17]

A] General Measures :

- Regular exercise
- Observing fast
- Fomentation
- Purgation
- Blood letting
- Use of dry foods
- Body rubbing with prescribed powders
- Taking food after the digestion of the earlier
- use of barley in diet.
- use of old wheat in diet.
- Avoiding excessive sleeping.
- Regular sexual activity.
- Running
- Swimming
- regular Bath

B] Drug Therapy :

1. Use of haritaki (*Terminalia chebula*) with honey
2. Decoction made from – Trifala, Amaltas, Patha, Saptaparna, Kutaj, Mustak, Madanfala, Nimba.
3. Decoction made from – Nagar Musta, Aragwadha, Patha, Trifala, Devdaru, Goksur, Khadir, Nimba, Haridra, Daruharidra, Kutaj

4 Powder of above said drugs for rubbing (udwartan and udgharshan) before bath.

5. Decoction made from – Powder of Trikatu, Trifala, Vidanga, Ajmoda mixed with honey.

6. Vyoshadi Sattu

7. Powder of – Vidanga, Suntha, Kshar, Loha bhasma, Yawa and Aamalaki with honey is best in reducing the weight.

8. Bilvadi Panchamula with honey and Agnimantha with Shilajit is best in reducing the weight.

9. Food grains to be used – Shyamak, Yawa (Barley), Kodrava (*Paspalum scrobiculatum*)

10. Lentils to be used in diet – Munga (*Phaseolus mungo*), Kulthi (*Dolichos biflorus*) and Aadhaki (*Cajanus cajan*).

11. Use of 'Ushkadi Gana' drugs which include Shilajit (*Asphaltum*), Kasis (*Green vitriol* – FeSO_4), Tuthyak (*Blue vitriol* - CuSO_4), Saindhav (rock salt), Ushaka (alkaline clay) and Hingu (*asfoetida*) especially when atherosclerosis and dislipidemia is associated with diabetes.

Treatment of Atherosclerosis as Per Modern Science

A] Preventive – Avoiding Risk Factors :

1. Cessation of smoking
2. Regular exercise

B] Curative Therapy :

1. Antiplatelet therapy with aspirin or clopidogrel.
2. High dose statins
3. Peripheral vasodilator cilostazol may be given to improve walking.
4. Treatment of coexisting conditions such as diabetes and hypertension.
5. Angioplasty or bypass if symptoms persists after 6 months of treatment.

Discussion

Acharya Nischalkara had defined the 'Dhamani Pratichaya' (atherosclerosis) as the deposition of fat rich layer in the lumen of the blood vessels. Acharya Charaka had described atherosclerosis in 'Santarpaniya' chapter of his treatise 'Charaka Samhita'. Whereas acharya Sushruta had gave the detail account of pathogenesis of atherosclerosis while describing the Rasa Nimitta Sthaulya in sutrasthana chapter fifteenth of this treatise 'Sushrut Samhita'. Many modern studies had proven the role of dietary and lifestyle risk factors enlisted by Ayurvedic acharayas in the development of atherosclerosis. Under preventive measures, periodic blood letting is the novel concept put forth by Ayurveda which can be employed in the form of periodic blood donation. Rubbing of specific powders is also novel concept apart from regular exercise. The dietary food that has been advocated by Ayurveda is the use of millets which are known for its low glycemic index and high fibre content. The therapeutic agents so prescribed are the scrapping, drying and digesting agents which dries up the oil content of plaque, scraps the excess fat and digesting agent digests the lipids thereby decreasing the risk of overt complications.

Conclusions

1. The disease atherosclerosis is very well described in ancient Indian medical science, Ayurveda.
2. It has the same aetiopathogenesis as what we notice today.
3. Atherosclerosis is systemic disease and can affect any artery

4. Myocardial infarction and brain stroke are the life-threatening complications of atherosclerosis.
5. Ayurvedic remedial measures can prevent and cure the atherosclerosis.

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