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ANGINA PECTORIS: MANAGEMENT THROUGH AYURVEDA

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ABSTRACT

Ayurvedic medicines have been used for centuries for various illnesses. Same way it has also been used to treat cardiovascular diseases like angina pectoris, this review discusses the remedies of angina pectoris. Angina pectoris is a medical condition of low oxygen supply to the heart. Major factors responsible include consuming alcohol, eating fast food and cigarette smoking. This review includes symptoms, diagnosis and pathophysiology of the disease. Later it includes the allopathic medicines used for this condition and Ayurvedic herbs are discussed in detail.

INTRODUCTION

Angina pectoris occurs when the heart is supplied with less amount of oxygenated blood. This happens due to the blocking of the blood vessel with cholesterol which reduces the path width of the blood vessel.This mostly leads to a heart attack when the blockage is around 90 to 100 % in the blood vessel.The best method to prevent angina is doing yoga, eating healthy diet, stop smoking, avoiding alcohol consumption and reducing the stress

Causes:

The common cause of angina pectoris is thickening of the wall of blood vessels with cholesterol and restricting the amount of blood which flows through the blood vessel.

Symptoms only occur when there is a need for increased blood flow to the heart liken during any exercise, running and when the person is under a lot of stress.

Due to reduced size of blood vessel the supply of oxygen is limited so there is severe pain in the chest area

These symptoms may also occur when the person is at rest which maybe a severe cause of angina pectoris

Types:-

1. **Stable angina**
   This is the most common type of angina which occurs. This angina is predictable. This occurs with the majority of the people. In this there are occurrences of symptoms while doing exercise, during running and working under stressful conditions. These symptoms last for only 5mins. The patient can be stabilised by giving appropriate medication like nitro-glycerine under the tongue.

2. **Unstable angina**
   This is less common and unpredictable. The pain is severe and lasts longer. The pain even occurs during rest. The pain is unbearable and there is a need for visiting the doctor for check-up or visiting a hospital for check-up.The patient may even need to be hospitalized to prevent the upcoming heart attack. This condition cannot be controlled by giving nitro-glycerine under the tongue.

Symptoms: -

They usually start during exercise and during stress

- Feeling of weight on the chest.
- Shortness of breath
- Numbness on the left shoulder and arm
- A feeling of blockage in the throat
- There is uneasiness in shoulder,arms,jaws,teeth, ears and stomach[1]

Diagnosis

First after hearing the symptoms an ECG has to be done. Some patients' EGC is normal but they do suffer from angina pectoris. So they are suggested to do a chest x-ray for further investigation to see if there is fluid build-up in the lungs.

There is no exact test to show the diagnosis of angina. But some blood tests can tell the suspected heart attack like given below.

1. **Exercise stress test** – in this the ECG is taken before, during and after the exercise to see the blood flow to the heart. This is done for stable angina.
2. **Thallium test** – in this a radioisotope is inserted into the circulation through injection and it gives more precise information about the condition of the blockage of arteries and also about the amount of blood flow to the artery.
3. **Dobutamine ECG**- here dobutamine is injected on patients who are unable to walk on treadmills. They are injected with the drug, this drug increases the heart rate and blood supply to the left ventricle. If there are any abnormal results obtained during the ultrasound is confirmed by slowing of the muscle which proves that there is blockage in the blood vessel and the blood supply is restricted.
4. **Coronary angiogram**- a thin plastic tube like a capillary or thread is inserted through the artery or groin. This tube releases a harmless dye, which detects if there is any blockage of the artery more accurately then the rest of the methods given above. This method is done only when the cases are at extreme stage and is the decision of the doctor.[2]

PATHOPHYSIOLOGY

Myocardial ischemia is caused when there is reduced oxygen supply to the myocardium. This leads to switching the cells from aerobic to anaerobic cells causing impairment of metabolic, mechanical and electrical function. Studies have shown that adenosine which is generated from ATP is the main cause of angina pain.

ATP is broken down to adenosine which diffuses to extracellular space further causing dilation and angina pain. Adenosine stimulates the A1receptors .heart rate, myocardial wall tension and myocardial ionotropic state increases the oxygen supply demand. This increase the aortic pressure and ventricular volume which further results in an increase in oxygen demand. Increased oxygen demand is met by increased coronary blood flow this is referred to as coronary flow reserve.

Myocardial ischemia is a result of the following:-

- Reduction of blood flow
- Abnormal constriction and relaxation or coronary microcirculation
- Reduced oxygen supply

Atherosclerosis is the main cause of angina pectoris. The condition of the patient to not able to fulfil the demand of increased oxygen supply and blood flow during exercise is called angina. [3]

ALLOPATHIC REMEDIES

Classification

Nitrates

1. **Short acting** : Glyceryl trinitrate (GTN,Nitroglycerine)
2. **Long acting**: Isosorbide dinitrate (short acting by sublingual route), Isosorbide mononitrate, Erythrityl tetranitrate, Pentaerythritol tetranitrate.

Beta blockers: Propranolol, Metoprolol, Atenolol and others.

Calcium channel blockers

1. **Phenyl alkyl amine**: Verapamil
2. **Benzothiazepine**: Diltiazem
3. Dihydropyridines: Nifedipine, felodipine, amlodipine, nitrendipine, nimodipine, lacidipine, Lercanidipine, Benidipine.

Potassium channel opener: Nicorandil

Others: Dipyridamole, Trimetazidine, Ranolazine, Oxyphedrine. [4]

AYURVEDIC REMEDIES

This overview encompasses the discoveries of using plants with medicinal values in the treatment of cardiovascular diseases, with more emphasis given to angina.

Allium sativum Linn. (Garlic) is helpful in maintaining blood pressure and decreasing cholesterol by alleviating vata doshas. Garlic is known to lower blood pressure, boost the immune system, fight infections; such as cold and flu, and prevent cancer. It has been proven by many researchers that the herb is useful in treatment of hyperlipidemia by increasing the production of nitric oxide hence leading to vasodilation and relaxation of smooth muscles. It also is helpful against parasites, ulcers and even slows the growth of existing tumors [3,4]. Alcoholic extract showed significant anticoagulant, fibrinolytic and hypercholesterolaemia activity in rabbits [5].

Terminalia arjuna (Roxb.) Wight & Arn. (Arjuna) bark is used as medicine [6]. Clinical studies have shown the efficacy of the bark of T. arjuna in congestive cardiac failure, chronic stable angina and hypertension because of its vasodilatory effect. T. arjuna and its constituent, Arjunolic acid have shown cardio protective effects due to antioxidant activity in rats [6].

Azadirachta indica A. Juss. (Neem) is helpful in coronary artery disorder and heart arrhythmias, in addition to protecting in opposition to ulcers and strep infections. It possesses anti-inflammatory, hypoglycaemic, antiviral and antibacterial properties [7, 8].

Ginkgo biloba: The leaves of this plant are used as food in China. The compounds of extract increase blood flow through peripheral, cerebral blood vessels, reduce vascular permeability, selective antagonism of platelet activating factor, anti-ischemic and anticonvulsant. As a reason used for treating circulatory disorders, Alzheimer's disease and peripheral vascular disease [9-12].

Curcuma longa Linn. (turmeric) and its constituent, curcumin possess hypolipidemic effect, antiatherosclerotic action and antithrombotic effects. The antioxidant effects of curcumin have been shown to attenuate adriamycin-induced cardiotoxicity and may prevent diabetic cardiovascular complications. Though much is not clinically proven, it may prevent cardiovascular complications associated with diabetes, and has antithrombotic, antiproliferative, anti-inflammatory, and lipid lowering effects [13-16].

Pushkarguggulu (prepared form Pushkarmoola and Guggulu) has shown anti anginal and hypolipidemic activities in coronary heart disease. The hypolipidemic potential of guggul (Commiphora mukul) was effectively coupled with the antianginal efficacy of Pushkarmoola (Inula racemosa) to yield a combination capable of providing relief of chest pain as well as improved functional status in 200 patients having ischemic heart disease[17-18].

Valeriana officinalis: Usually known as valerian, used as perfume added into food and beverages. Belonging to the valerianaceae family is a well-known herb and medicinal plant that has been widely used all over the world especially in Europe, China and Middle East. The root and rhizome of the valerian plant (Valeriana officinalis L.) is used medicinally for its sedative properties with indications including nervous tension, insomnia, anxiety and stress [19-21].

Emblica officinalis Gaertn. (Amla/Amalaki) is used to rebuild and maintain new tissues and increase red blood cell count. This Plant has shown its mettle in the regions of digestive, heart health, and diabetics. Plant even assists to reduce the toxic side effects of chemotherapy, restores antioxidant status to the kidneys, and reduces blood sugar ranges in diabetics. Preclinical studies have shown that amla possesses antipyretic, analgesic, antitussive, antiatherogenic, adaptogenic, cardio protective, gastro protective, antianemia, anti hypercholesterolemia, wound healing, antidiarrheal, antiatherosclerotic, hepatoprotective, nephroprotective, and neuroprotective properties [22-25]

Digitalis purpurea L. and Digitalis lanata: These plants are members of Scrophulariaceae family. The extracts of these plants have cardiac glycosides (digoxin, digitoxin, and cardenolides) in the treatment of heart disorders [26].

Dan shen (Salvia miltiorrhizae Radix) a native to Japan and China, is a vital part of Chinese Herbal Medicine. Also known as the Chinese Sage or the red sage. The dried roots are used as treatment for angina pectoris, hyperlipidemia, acute ischemic stroke and other heart related diseases including cerebral atherosclerosis, diffuse intravascular clotting, thrombophlebitis, and thromboangiitis obliterans. Tanshinone (I, IIA, and IIB) and salvianolic acids (A, B); the active constituents; have been shown to have anticoagulant, vasodilatory, anti-inflammatory, free-radical scavenging, and mitochondrial-protective actions, and can increase blood flow [27-28].

Crataegus is a large genus of trees and shrubs in the rose family, Rosaceae. Hawthorn (C. oxyacantha), also known as Hawthorn. The active compounds in hawthorn are thought to be oligomeric procyanidins and flavonoids. Current claims suggested that hawthorn could be used as an alternative therapy for various cardiovascular diseases, such as angina, hypertension, hyperlipidaemia, and arrhythmia [29].

CONCLUSION

Recently many people have been seen who are suffering from angina pectoris. The people might get pain in the chest only when doing exercise otherwise they will be like normal human beings. This type of stable angina can be relieved by avoiding exercise and give nitro-glycerine. For unstable angina various medication has to be given. There are various allopathic and ayurvedic medicines which are used for angina pectoris. The review discusses the various ayurvedic medicines which can be used for the treatment as or whole or some part of the plant.

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