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Functional properties of Garlic on Cardio- Vascular diseases in Ayurveda & modern medical system - A Literary review

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Abstract

Garlic (*Allium sativum*) and its preparations have been widely recognized as agents for prevention and treatment of cardiovascular and other metabolic diseases, atherosclerosis, hyperlipidemia, thrombosis, hypertension and diabetes both in Ayurvedic & modern medicine. Effectiveness of garlic in Ayurvedic medicine for cardiovascular diseases was more encouraging in experimental studies, which prompted several clinical trials. In platelet rich plasma (PRP) most of the anti-aggregatory activity of garlic clove homogenates was due to adenosine; however, in whole blood neither adenosine nor the polar fraction had any effect and all of the anti-aggregatory activity was due to allicin and other thiosulfinates. Allicin was equally active in whole blood and PRP.

It is a great challenge for scientists all over the world to make a proper use of garlic and get its maximum beneficial effect to prevent cardiovascular disease. This review has attempted to make a bridge the gap between experimental and clinical study and to discuss the possible mechanisms of such therapeutic actions of garlic.

Classical text books ,Samhitha books in Ayurvedic Medicine and Scientific articles from accepted web sides were used as sources of materials. Therapeutic functions of Garlic found out from Classical Ayurvedic books and chemical componants and their functional activities collected from research articles. Finally all collected data analysed and understand how its functional activity on Cardio vascular diseases.

Key words: Garlic, Cardio- vascular diseases, Platelet aggregation

Introduction

Cardiovascular disease is associated with multiple factors such as raised serum total cholesterol, raised LDL and an increase in LDL oxidation, increased platelet aggregation, hypertension, and smoking. Numerous in vitro studies have confirmed the ability of garlic to reduce these parameters. Thus, garlic has been shown to inhibit enzymes involved in lipid synthesis, decrease platelet aggregation, prevent lipid peroxidation of oxidized erythrocytes and LDL, increase antioxidant status, and inhibit angiotension-converting enzyme. Not only in modern

medicine, thousand years before Ayurvedic medicine said that Garlic has good ability to prevent cardio vascular diseases. So, this study for finding functioning properties to prevent cardio vascular diseases in both Ayurvedic and Modern medicine in Garlic.

History of several thousand years of consumption of garlic is native to Central Asia and Northern Eastern Iran, has long been a common seasoning world wide. It was known that ancient Egyptians mainly used garlic for food flavouring and in medicines.

Garlic types

Allium sativum, Allium vineale, Allium canadense, Allium oleraceum are the main garlic types in world wide. Common garlic type is Allium sativum, Allium vineale (as wild garlic or crow garlic) mainly grow in North America, Allium canadense (known as weadow garlic) common weed in fields. Single clove garlic originated in the Yunnan of China. But most common garlic type is Allium sativum. It has two sub varieties, A. sativum and A. ophioscorodan called as hard necked or purple stripe garlic, porcelain garlic, rocembic garlic.

Allium sativum called as soft necked garlic, artichoke garlic, silver skin garlic and creole garlic is the other variety of Allium sativum.

Scientific classification of Garlic

Kingdom: Plantae

Class: Monocot

Order: Asparagales

Family: Amaryllidaceae

Sub family: Allioideae

Genus: Allium

Species: Allium sativum

Garlic is easy to grow and can be grown year round in mild climates. Although sexual propagation is possible, mainly garlic cultivation is done by asexually, planting individual cloves in the ground. Usually cloves planted in the Autumn and harvested in late spring or early summer.

Garlic plants are usually not affected by many pest or diseases. Any way pathogens that affect garlic are nematodes, woody decay fungus and pink root disease.

Uses of garlic

Garlic is mainly used around the world because of its pungent flavor. Garlic bulb is the most commonly used part in the plant. Garlic cloves are used for consumption or for medicinal purposes.

Garlic has characteristic pungent, spicy flavor that mellows and sweeten considerably by cooking. Garlic clove, leaves, flowers are the eatable parts of the plant. Mainly South Indians like garlic flavor. Garlic may be applied in different kind of breads. Garlic leaves and pearl curry is popular curries in South Asian countries. Garlic powder usually used as substitute for fresh garlic.

History of garlic

Garlic used in China thousand of years before. Garlic was used by ancient Greek and Roman soldiers, sailors and rural classes according to Pliny. They believe that garlic helps to cure all diseases. According to Pliny ,garlic and onions were invoked as deities by the Egiptians at the taking of oaths. Garlic was rare in traditional English cusine and has been a much common ingredient in Mediterranean Europe.

Chemical composition of Garlic

Garlic mainly consists of proteins, carbohydrates, sugars, dietary fibers, little amount of fat, vitamains like Thiamines, Riboflavin, Niacin, Pantocthenic acid, vitamin B6,folate,vitamin C. Also minerals like calcium,Iron,magnesium,manganese,phospharous,potassium,sodium,zinc and other constituents like water and selenium.

Medicinal effect of garlic

Garlic used as traditional medicine in South Asian Countries ,specially in India and Sri Lanka. According to modern medicine also believe that garlic has good action against cardio vascular diseases, specially prevent atherosclerosis due to its cholesterol lowering action. Also garlic reduce platelet aggregation ,people taking anti coagulant medications are cautioned about consuming garlic 2016 meta analysis shows that garlic has good ability to cure cancers of the upper digestive tract.2014 meta analysis shows that consumption of garlic reduce the cancer risk of the stomach, Colo -rectal part of the digestive system and prostate cancers. Because of its anti microbial effect used for fish and meet preservation, effects at the temperature as high as 120 celcius.

Adverse effects of garlic

Garlic is known as cause bad breath and body odor. The green ,dry folds in the center of the garlic clove are specially pungent, because of sulfur compounds allicin, ajoene,allyl polysulfides. Some people get allergies for garlic. Symptoms can be irritable bowl syndrome, diarrhea, mouth and throat ulcerations, nausea, vomiting .Also garlic external application can make skin irritations, allergies and burns. A large number of sulfur compounds attribute to the smell and taste of garlic. Allicin has been found to be the most responsible for the “hot” sensation of raw garlic. If higher than recommended dose of garlic are taken with anti coagulant medications, can lead to a higher risk of bleeding.

Spiritual and religious uses of garlic

In myths, garlic has been regarded as a force for both good and evil. Central European folk beliefs considered that garlic is a powerful ward against demons, werewolves and vampires to ward wampires ,garlic could be worn, hung in windows or rubbed on chimneys and key holes.

In Iranian countries ,garlic is one of the item in the seven-seen table, at traditional new year display .In Islam ,it is recommended not to eat raw garlic prior to going mosque. In both Hindunism and Jainism, garlic is thought to stimulate and warm the body and to increase one's desires. Some Hindus generally avoid using garlic and related onion species for religious festivals.

In Buddhism, garlic consider as on one of the pungent species, so will stimulate sexual and aggressive drive.

Effect of garlic on cardio vascular diseases

Cardio vascular diseases are associated with multiple factors such as raised serum total cholesterol ,raised LDL and increased platelet aggregation ,hypertention, smoking. Numerous vitro studies have confirmed the ability of garlic to reduce these parameters. Garlic has been shown to inhibit enzymes involved in lipid synthesis, decrease platelet aggregation, prevent peroxide oxidation of oxidized erythrocytes and LDL, increase anti oxidant status and inhibit angiotension converting enzymes. Since 1993,44% of clinical trails have indicated a reduction in total cholesterol ,the most profound effect has been observed in garlic 's ability to reduce platelet aggregation .Garlic is also reported to inhibit the pathogenesis of cardio vascular disease and to prevent cancer and other chronic diseases associated with aging.

Several studies have indicated that garlic inhibit key enzymes for cholesterol and fatty acid synthesis. HMG-CoA is the enzyme necessary for cholesterol bio synthesis, garlic inhibits HMG-CoA synthesis.

The enzyme action of garlic ,prevent action of ADP and Platelet activating factor (PAF) helps to prevent platelets aggregation ."Ajone" another garlic derivative ,has been shown to inhibit platelet aggregation in vitro.

Fibrinolysis also enhanced by garlic ,resulting in dissolution of clots and thrombos. In vitro studies have demonstrated that aged garlic extract improves circulation and blood properties by preventing peroxidation and hemolysis in oxidized erythrocytes. Recent studies has confirmed that garlic improves the fluidity of erythrocytes isolated from hyper cholesterolemic rats.

Garlic extract has been shown that modulate the production and function of beta endothelium derived releasing factor (NO) and constructing factors (endothelin-1) in isolated rats pulmonary arteries. Garlic extract shows some beneficial effect on heart rate. Any way some times high doses of garlic extract can make adverse effects. Another important property in garlic is Gama Glutamyl cysteines ,which helps to reduce blood pressure.

Functions of garlic in Ayurvedic aspect

According to Bhawaprakashaya poorva kanda, Garlic is described under Haridradi varga.

Synonyms

Rasona, Lashuna, Uraganda, Anishta, Yawaneshta, Rasonaka

Birth of garlic according to Ayurveda

When Vainateya (Garuda) snatched away the pot of nectar from the Lord of Indra the drop of nectar fell on the ground and became Rasona describes according to its characteristics of lack of sour taste. Pungent in its roots, bitter in its leaves, astringent in its tubes, salt in its tip of the tubes and sweet taste in its seeds said by wise.

Garlic nourishing aphrodisiac, unctuous, hot in potency, digestive, laxative, pungent both in taste and penetrating, unifies broken bones, good for throat, hard for digestion, aggregate pitta and blood, good for improving intelligence, vision, rejuvenation, cures diseases of heart, chronic fever, pain in abdomen, constipation, abdominal tumours, cough, skin diseases origin from kapha.

According to Ashtanga Samhitha garlic is penetrating, hot in potency, pungent at the end of the digestion, makes the bowel movement, good for heart.

According to Danvanthari Nigandu also describes that garlic is good for digestion pungent, hard, air aggregative, good for abdominal tumors, abdominal flatulence and heart diseases.

According to Susrutha samhitha garlic used for Sciatica, osteo arthritis, paralysis eczema, intoxications, insects, neurological diseases, constipation, pain in abdomen, piles, heart diseases, oedema internally.

Chemical component which include in garlic called Allicin helps to destroy Tuberculosis bacteria.

Function of garlic on cardio vascular diseases mainly described on Charaka samhitha, which says that because of its astringent taste, digestive power, reduce aggregation mechanism of blood reduce obstructions in blood vessels which prevents heart diseases. Also by reducing kapha dosha according to Ayurveda which helps to prevent aggregation of toxins inside the blood vessels.

Conclusions

According to previous research garlic consumption reduced risk of cardiovascular disease progression. The wealth of scientific literature supports the proposal that garlic consumption have significant cardioprotective effect, which include both animal and human studies. But certain issues regarding the proper use of garlic, use of different preparations available, dose,

duration and interaction with generic drugs should be optimized. Further research should also be carried out to identify specific compounds from garlic or garlic products that are responsible for most of its biological effects.

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