

A Review Article On *Trimada* With Special Reference To Hyperlipidemia

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ABSTRACT

Coronary Artery Disease is the major cause of death worldwide among all income groups. Although health care system is getting improved because of globalization, the indulgence in western and sedentary lifestyle lead to higher prevalence of cardiovascular risk factors. One of the major cause of CAD is Hyperlipidemia. It is defined as a condition characterized by elevated lipid levels in the human body. *Ayurveda* has a unique approach in understanding and treating Hyperlipidemia. Hyperlipidemia being considered not as a disease but a symptom in various ailments. The conditions are co-related with *Rasavaha sroto dushti rogas* described in ayurvedic texts since ancient times. This is a disease of diminished *Agni* (*Jatharagni*, *Dhatwagni* and *Bhutagni*) which creates a flaw at the level of *Agni*. Keeping this in mind we can plan the treatment of Hyperlipidemia in the line of treatment of *Rasavaha sroto dushti* and for that *Deepana*, *Pachana* and *Kaphghana* properties are needed. *Trimada* is one of the most popular formulations used in *Ayurveda* for various purposes. It consists of three drugs - *Chitraka*, *Mustaka* and *Vidanga*. The paper aims to set the co relation between Hyperlipidemia and the role of utilizing the three drugs of *Trimada* for the prevention and cure of Hyperlipidemia.

KEY WORDS: Hyperlipidemia, *Rasavaha srotas*, *Trimada*, *Meda dhatu*, *Ayurveda*, *Agni*, Oxidative stress

INTRODUCTION

Hyperlipidemia, which is abnormally high levels of fats (lipids) in the blood. It is represented with increased blood cholesterol or triglyceride levels or both. At national level, recent studies have reported that high cholesterol is present in 25-30% of urban and 15-20% rural subjects. This prevalence is lower than high-income countries^[1]. The increase in the level of cholesterol, triglycerides, LDL and decrease in HDL particles in the bloodstream are strongly associated with atherosclerosis, which is the principle cause of CAD^[2]. CAD (Coronary Artery Disease) is the primary cause of death globally with a recognized set of risk factors including mainly high blood pressure, high LDL cholesterol, impaired glucose tolerance and diabetes^[3].

Causes of Hyperlipidemia: Abnormal levels of Cholesterol are the result of sedentary life style, wrong dietary intake and bad eating habits. To some extent metabolic conditions, genetic factors and family history too are the contributing factors. The abnormal cholesterol levels form plaques that cohere inside blood vessels causing atherosclerosis leading further complications. High concentration of plasma total cholesterol and LDL cholesterol are co-related with the prevalence of CAD, stroke and peripheral vascular disease .

Psychological stress is associated with increase oxidant production causing oxidative stress^[4] is one of the causative factors that link hyperlipidemia with the pathogenesis of atherosclerosis. Oxidized lipids can elicit a wide variety of biological responses that could contribute to atherosclerotic lesion development. Thus, the pathophysiology of the disease suggests that a combined antioxidant and lipid lowering activity would have marked benefits in ameliorating the progression of the atherosclerotic lesion^[5]. *Ayurveda*, The Ancient Indian Medical System is a body of organized knowledge explaining principles of physiology, pathology, pharmacology and therapeutics in various specialties. It defines life (*Ayu*) as a union of mind, body, spirit, and senses and a person is said to be healthy if all these factors are in the balanced state. According to the *Ayurvedic* concept, *Dosha*, *Dhatu* and *Mala* are the three pillars of the body. Our body is made up of innumerable channels (*Srotas*) which are responsible for proper functioning of physiological activities. The term *Srotas* is derived from "*susravana*" which means to flow, to ooze out. *Srotas* are those channels through which materials flow in the body^[6]. Basically, they are the inner transport system of the human body which act as platform for activities of important bio factors like *Doshas*, *Dhatu*, *Mala*, *Oja*, *Agni* etc.

"*Rasavahanama srotasama hridayam mulam dash ch dhamnaye*" (Ch.Vi 5/7)

Acharya Charaka, Sushruta and Vagbhatta had described various types of *srotas*, among them *rasavaha srotas* is one. *Hridaya* and 10 *Dhamniya* are the *mulas* of *rasavaha srotas*^[7].

"*Guru sheetam atisnigdham atimatram samshrantama, Rasavahini dushyanti chintyanama ch atichintnata*" (Ch.Vi 5/13)

Factors responsible for the *dushti* (spoilage) of *Rasavaha srotas* are bad eating habits like *Guru* (heavy food), *Atisnigdha ahara* (oily food), *Sheeta ahara* (cold food), *Atimatram* (Excessive eating) etc. *Atichintya* (overthinking) is also one of the major reasons of *Rasavaha Stroto Dushti*^[8].

The lexicons have not directly correlated Hyperlipidemia but has purported the *Rasavahastroto dushti* causing *Medovaha stroto dushti* symptomatically leading to *Atisthaulya*. In *Ayurvedic* literatures, obesity and subsequent pathological consequences has been termed as *Atisthaulya*. *Medativridhhi* and *Vishama-dhatuposhana* are the key pathological phenomena in *Atisthoulya*^[9].

MATERIALS AND METHODS

Physiological Aspect: The *Dhatus* are the structural components of the body which take part in the construction of the body. An increase or decrease in their quantity indicates the presence of metabolic or nutritional disorders in the body caused by improper formation of *Rasa Dhatu*.

After the digestion of the food the *Poshaka rasa dhatu* is formed (essence of the food whose purpose is to nourish). This *Rasa dhatu* being pushed by *Vyana vayu* reaches the heart and from the heart it enters the *Dhamanis* through which it reaches the different parts of the body. This way the *Rasa dhatu* nourishes the other *Dhatus* and forms other *Dhatus* like *Rakta*, *Mamsa*, *Meda dhatu* etc. As the *Rasa dhatu* circulates it nourishes the tissues, organs etc. In the healthy state this *Poshaka rasa* does *Tarpanam* (nourishes the people at all ages), *Vardhanam* (growth and development), *Dharanam* (providing strength), *Avsadanam* (provide stability to the body) etc ^[10].

The triggering factors cause *Rasa dhatu dushti* and *Rasavaha srotodushti* which affects the metabolism through vitiation of the *Doshas* and the *Dhatus*. This results in vitiation of the digestive fire (*Jatharagni*) causing annulment of *Rasa dhatu*. *Agni* is the basic medium responsible for the digestion and metabolism in the body. *Ras dhatu* being the primary *Dhatu* disturbs the other *Dhatus* in the body like *Rakta* and *Meda dhatu* which may lead to further aggravation of symptoms of hyperlipidemia. The disturbed *Meda dhatu* tends to form the *Mala* which clings to the *Strotas* causing hyperlipidemic disorders.

Dravyaguna Vigyana is the bridging subject of *Ayurveda* which deals with the properties, actions & uses of *Dravyas* (Drugs). The *Ayurvedic Pharmacology* of drugs is described under the heading of *Dravya*, *Rasa*, *Guna*, *Virya*, *Vipaka*, *Prabhav* and *Karma*. As per the principles of *Ayurveda* drugs which are *Kaphahara* with *Deepana*, *Pachana*, *Bhedana* and *Lekhana karma* have a best role in Hyperlipidemia. The drugs with *Deepana* and *Pachana karma* increases the digestive fire (*Jatharagni*) due to *Vayu* and *Agni* predominance. The drugs with *Lekhana* and *Bhedana karma* works in scraping of *Dhatus* and *Malas* (lipid waste) after absorbing moisture from them and disintegrate them in channels. *Yogindranath Sen* opines that *Bhedana dravya* liquifies the *Pindita mala* and expels it out ^[11].

Drug review:

India has a rich heritage of medicinal plants. It has a wide diversity of flora, which are used by the local population and traditional healers for the treatment of several diseases including lipid disorders. The three drugs of *Trimada* viz. *Chitraka*, *Mustaka*, *Vidanga* are briefly described as follows:



Image of roots and plant of *Chitraka*



Image of roots and plant of *Mustaka*

Image of seeds and plant of *Vidanga***CHITRAKA**

Plumbago zeylanica Linn. Known as *Chitraka* of family Plumbaginaceae is a perennial shrub widely found throughout peninsular region and eastern parts of India. It has striated and erect stem with ovate leaves short petiole, apex acute or subacute. Flowers are white with stalked glands, havinhg ellipsoid Ovary with acute and furrowed capsule^[12].

Charaka has mentioned it in *Lekhaniya*, *Bhedaniya*, *Dipaniya*, *Arshoghna*, *Triptighna* and *Sulaprasamana mahakshaya* and in *Katuskandha*^[13]. *Sushruta* has mentioned it in *Aragvadhadi*, *Varunadi*, *Muskadi*, *Pippalyadi*, *Mustadi* and *Amalakayadi gana*^[14]. As per *Charaka*, *Chitraka* is considered as best herb among *Dipaniya*, *Pacaniya*, *Arsoghna* and *Sulahara* drug^[15].

The plant is also commonly recommended for obesity^[16]. Plumbagin, a major phytoconstituent of roots of *Plumbago zeylanica* has been reported to demonstrate anti-hyperlipidemic activity in rabbits^[17]. Various studies suggest that the aqueous extract of *Plumbago zeylanica* roots has potential antioxidant activity Thus, can prove to be beneficial in the management of atherosclerosis and hyperlipidemic condition.^[18]

MUSTAKA

Mustaka (*Cyperus rotundus* L.) also known as the nutgrass of family Cyperaceae, is a colonial, perennial herb widely used in *Ayurveda* to treat several ailments. It is 7–40 cm tall with fibrous roots and has dark reddish-brown rhizome. Shiny and narrow dark green leaves which looks like grass are present. The upright stems support a much-branched inflorescence with bisexual flowers^[19]. *Charaka* has mentioned it in *Lekhaniya*, *Triptighna*, *Kandughana*, *Stanyashodhana mahakshaya*^[13]. *Sushruta* has mentioned it in *Vacadi* and *Mustadi gana*^[14]. It is an acclaimed digestant & carminative.

This plant has various metabolites that show analgesic, anti-hypertensive, anti-inflammatory, anti-obesity, antioxidant, cardioprotective, neuroprotective properties. Studies on the ethnobotanical use of *C. rotundus* showed that the rhizomes were used to treat aging, atherosclerosis, cancer and various disorders^[20]. The alcoholic and aqueous extracts of the tubers of *Cyperus rotundus* possess lipolytic action by regulating serum lipid profiles, reducing the oxidative stress and decreasing adipose tissue mass and body weight gain^[21].

VIDANGA

A famed herb in *Ayurveda*, *Vidanga* of family Myrsinaceae is a large woody flexible, long shrub with hairy brownish grey roots. The leaves are elliptical, lanceolate, obtusely acuminate somewhat silvery beneath, with cylindrical petiole. Flowers are small, pentamerous, numerous. Petals are free, greenish-yellow, long. Fruits are smooth, globose, black when ripe, The seeds are horny, reddish^[22].

Charaka has mentioned it in *Krimighna*, *Kushthaghna*, *Truptighna mahakshaya*^[13]. *Sushruta* has mentioned it in *Surasadi gana*, *Pippalyadi gana*^[14].

Administration of *Embelia Ribes* ethanolic extract to diabetic rats produced considerable reduction in serum lipase activity, that suggests its potential in prevention of lipid abnormalities and obesity^[23]. Pretreatment with embelin (50 mg/kg) significantly decreased the elevated levels of serum lipid levels and lipoproteins in high fat diet induced obese rats^[24].

PROPERTIES OF INDIVIDUAL DRUGS

Plant	Botanical Name	Rasa	Guna	Veerya	Vipaka	Dosha Action
<i>Chitraka</i> ^[25]	<i>Plumbago zeylanica</i> (<i>Plumbaginaceae</i>)	Katu	Laghu, rooksha, tikshna	Ushna	Katu	Kaphvatashamak
<i>Mustaka</i> ^[26]	<i>Cyperus rotundus</i> (<i>Cyperaceae</i>)	Tikta, katu, kshaya	Laghu, rooksha	Sheeta	Katu	Kaphpittashamak
<i>Vidanga</i> ^[27]	<i>Embelia ribes</i> (<i>Myrsinaceae</i>)	Katu, kshaya	Laghu, rooksha, tikshna	Ushna	Katu	Kaphvatashamak

Name of Plant	<i>Panchbhautika</i> Composition	<i>Karma</i>	<i>Panchbhautika</i> Composition ^[28]
<i>Chitraka</i>	<i>Vayu + Agni</i>	<i>Deepana</i>	<i>Vayu (predominant) + Agni</i>
<i>Mustaka</i>	<i>Vayu + Agni</i> <i>Vayu + Aakash</i> <i>Vayu + Prithvi</i>	<i>Pachana</i>	<i>Vayu + Agni</i> <i>(predominant)</i>
<i>Vidanga</i>	<i>Vayu + Agni</i> <i>Vayu + Prithvi</i>	<i>Lekhana</i>	<i>Vayu + Agni</i>

DISCUSSION

As per the pathophysiology of Hyperlipidemia which is the result of *Medo dhatu vikara* due to *Rasa dhatu dushti*. *Agni deepaka*, *Kaphahara* and *Pachaka dravyas* are beneficial. To prevent the adherence of *Mala* (lipid waste) in the *Srotas*, the drugs that are finest in *Bhedaka* and *Lekhana karma* are used. The properties of *Trimada*, are exactly what is required for the treatment of hyperlipidemia. This action is attributed to their *Rasa*, *Guna*, *Veerya* and *Vipaka*. They restore the metabolism by triggering the absorption and metabolism of *Meda* (lipids) in the body.

The three drugs *Chitraka*, *Mustaka* and *Vidanga* are *Katu rasa pradhana* possess *Katu vipaka*, *Laghu Rooksha guna* and *Kaph-Vatahara* properties. They equilibrate the metabolism by correcting the digestion and absorption of *Ahara rasa* as these drugs are digestants and carminatives. This in turn help to equipose the *Rasa dhatu* which further prevents the annihilation of *Rakta*, *Mamsa*, *Meda dhatus*. Thereby, balancing the *Agni* which helps in proper nourishment of other *Dhatus*. This endorses the proper flow of *Doshas* through different *Srotas* and also impedes the *Malas* to cling at one place. They work as an excellent drug to do the *Lekhana* as per their *Rasa panchaka* which demonstrate scraping action on the plaque adhering to the *Srotas* (blood vessels) and facilitate proper movement of *Dhatus*. Moreover, *Bhedaniya* action causes disintegration of the accumulated *Malas* (lipid waste) into smaller ones. This will prevent them from getting accumulated in the vascular system of human body. The Hyperlipidemia caused by oxidative stress where due to *Tamoguna* and *Atichintaniyam* the *Kapha dosha* gets vitiated disturbing the *Rasa*, *Rakta* and *Medo Dhatus*, these drugs are proven to be of prime utilization. Thus, this forestalls the symptoms and complications of Hyperlipidemia.

CONCLUSION

Hyperlipidemia being a common metabolic disorder is a leading cause of many serious illnesses ranging from increased cholesterol level to CAD. It is important to understand its pathogenesis and find the ways and means in traditional system of medicine that can work for the prevention of Hyperlipidemia. Role of *Trimada* is well known for curing diseases related with metabolic disorders. This review indicates a scientific rationale behind such use of *Trimada*. A large scale research and clinical trial is essential to confirm its therapeutic potency and increase the scope of use of *Trimada* for many disorders of such kind.

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