Original Research Paper

Volume - 15 | Issue - 05 | May - 2025 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Ayurveda

A REVIEW OF *SHILAJITWADI LAUHA* IN THE MANAGEMENT OF DYSLIPIDEMIA

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ABSTRACT Dyslipidemia is a condition characterized by an imbalance in the serum lipid levels, including total cholesterol (TC), low density lipoprotein (LDL), high density lipoprotein (HDL) and triglycerides (TG). It is a disorder of lipoprotein mechanism which may include overproduction or deficiency of lipoproteins or both. Abnormal levels of plasma lipoproteins can lead to increased risk of atherosclerosis which in turn causes complications like coronary artery disease (CAD), cerebrovascular accident (CVA), peripheral vascular diseases (PVD) etc. Asymptomatic nature of dyslipidemia, keeps the condition undiagnosed until the occurrence of complications. Dyslipidemia can be managed non-pharmacologically by diet modifications, weight reduction, physical exercise and avoiding cholesterol increasing drugs. Statins are the drug class of choice for pharmacological management of dyslipidemia. In Ayurveda, conditions like *Medoroga*, *Sthoulya*, *Shonita abhishyanda* etc. can be correlated with dyslipidemia. *Shilajitwadi lauha* (SL) is a formulation possessing *Kapha-medohara*, *Karshana*, *Deepana* and *Rasayana* properties. These properties are beneficial in managing lipid disorders. The present review is an attempt to critically review SL and understand its probable mode of action in the management of dyslipidemia.

KEYWORDS : Ayurveda, Dyslipidemia, *Medoroga*, Review, *Shilajitwadi lauha*

INTRODUCTION

Dyslipidemia is a group of disorders of lipid metabolism which are the major risk factor for atherosclerosis leading to coronary artery disease (CVD), cerebrovascular accident (CVA) or peripheral vascular disease (PVD). Dyslipidemia can be accompanied by overproduction and / or deficiency of lipoproteins. Dyslipidemia may encompass high LDL cholesterol, high triglycerides and/or low HDL cholesterol. This can occur alone or in combination of two or three. Lipids are transported in blood in forms of lipoproteins on the basis of which the term hyperlipoproteinemia is coined. High LDL cholesterol levels can cause fatty plaque to build up in blood vessels which is known as atherosclerosis, leading to CVD, CVA or PVD.[1] In India, high cholesterol level is reported to be the main non-communicable disease related risk factor. A prevalence of 37.5% among adults between 15 to 64 years of age has been reported by Indian Council of Medical Research (ICMR). Dyslipidemia is an asymptomatic condition due to which it remains undiagnosed and untreated. It is detected at the time of occurrence of any complications. Hence it is essential to detect and manage dyslipidemia timely in order to stop the disease progression and prevent complications. Dyslipidemia is managed through non-pharmacological and pharmacological measures in modern science. Life style modifications such as diet, weight reduction, physical exercise etc. constitute the non pharmacological management where as statins are the most widely used class of pharmacological agents.[2] Correlation of dyslipidemia to single condition is not possible in Ayurveda. It can be considered under the broad classification of *Santarpanajanya vikaras* having similarities with *Medoroga, Sthoulya* and *Shonita abhishyanda*. *Prakupita kapha dosha* is responsible for *Medovirdhi* and *Medodushti*.[3] *Apatarpana* line of management is required in *Medoroga* which can be done mainly in two ways viz. *Shamana* and *Shodhana*. SL is one such *Shamana* medicine mentioned in *Bhaishajya Ratnavali, Rajayakshma adhikara.*[4] It is a herbo-mineral combination of 7 ingredients which predominantly possess *Kapha-medohara, Karshana, Deepana* and *Rasayana* properties.

AIMS & OBJECTIVES

To critically review SL, an Ayurvedic herbomineral formulation, and understand its probable mode of action in the management of dyslipidemia.

MATERIALS AND METHODS

A thorough literary review was done in order to gather information pertaining to SL from *Samhitas* and published scientific articles. Results of phytochemical and experimental studies conducted on the ingredient drugs were reviewed to obtain supportive data for the mode of action of the formulation.

RESULTS AND DISCUSSION

Shilajitu, Madhu, Shunti, *Pippali, Maricha, Swarna makshika bhasma* and *Lauha bhasma* are the ingredients of SL. Scientific identity of the drugs, part used and quantity are mentioned in Table 1. All ingredients except *Madhu* are powdered separately into fine powder form and mixed together into a homogenous mixture. This is then taken in a *Khalva yantra* and triturated with *Madhu* to obtain fine paste consistency. Paste is kept in tablet punching machine and punched to prepare tablets weighing 250 mg. Tablets are then dried well in a drier. Properties of each ingredient drugs with their actions are mentioned in Table 2.

Table 1: Ingredients Of SL

Sl.	Name of the drug	Scientific name	Part used	Proportion
1	*Shilajitu*	Asphaltum		1 part
2	*Madhu*	Honey		1 part
3	*Shunti*	*Zingiber officinale* Rosc.	Rhizome	1 part
4	*Pippali*	*Piper longum* L.	Fruit	1 part
5	*Maricha*	*Piper nigrum* L.	Fruit	1 part
6	*Swarna makshika*	Chalcopyrite		1 part
7	*Loha bhasma*	Iron calx		6 parts

Table 2: Properties Of Ingredients

Dravya	***Rasa***	***Guna***	***Veerya***	***Vipaka***	***Doshaghnata***	***Karma***
Shilajitu	*Katu, Tikta*	*Yogavahi, Laghu*	*Ushna*	*Katu*	*Kapha Vata hara*	*Chedana, Rasayana, Mehahara*
Madhu	*Madhura, Kashaya*	*Laghu, Ruksha*	*Sheeta*	*Madhura*	*Kapha Pitta hara*	*Lekhana, Deepana, Mehahara*
Shunti	*Katu*	*Laghu, Snigdha*	*Ushna*	*Madhura*	*Vata Kapha hara*	*Deepana, Pachana, Grahi*
Pippali	*Katu*	*Laghu, Snigdha*	*Ushna*	*Madhura*	*Kapha Vata hara*	*Deepana, Pachana, Hridya,*
Maricha	*Katu*	*Laghu, Teekshna*	*Ushna*	*Katu*	*Kapha Vata hara*	*Deepana, Krimihara,*
Swarna makshika	*Tikta, Madhura, Amla*	*Laghu, Vyavayi*	*Sheeta*	*Katu*	*Kapha Vata hara*	*Lekhana, Rasayana, Mehahara*
Lauha	*Kashaya, Tikta*	*Guru, Sara*	*Sheeta*	*Madhura*	*Kapha Pitta hara*	*Medohara, Mehahara, Krimihara,*

Probable Mode Of Action

Pathophysiology of dyslipidemia in Ayurveda can be constructed considering the explanations of *Medoroga samprapti* by Charaka and Sushruta. Factors like *Kapha-vata doshas*, *Agni*, *Medodhatu* are

involved in the *Samprapti* of *Medoroga*. Increased *Agni* makes the person susceptible for extreme hunger and thus he consumes more quantity of food which contributes to *Medoroga.*[5] In this context Sushruta adds, though the *Agni* is increased, due to the increased frequency and quantity of food intake, *Ama* (a state of incomplete digestion, transformation or metabolism) formation occurs which in turn leads to increase in *Medodhatu.*[6] Thus it is clear that Ayurvedic management of dyslipidemia should be able to do correction of *Agni*, pacification of *Kapha-vata doshas* and reduction of excessive *Meda*. SL is one such formulation, the ingredients of which possess *Katu-tikta rasa*, *Laghu-ruksha guna*, *Ushna veerya*, *Katu vipaka*, *Kapha-vatahara* properties predominantly. These properties help in carrying out acions like *Deepana, Pachana, Chedana* etc. *Katu-tikta rasas* are *Kaphahara* and do *Rukshana* which reduces *Meda.*[7] As increased *Agni* is involved in the *Samprapti, Katu-tikta Rasas* may cause further *Agnivridhi*. This may be prevented by the actionof ingredients with *Madhura vipaka* and *Sheeta veerya. Pippali, Maricha* and *Shunti* helps in doing the *Pachana* of *Ama* and thus preventing the formation of excessive *Meda. Madhu* is first among the drugs possessing *Lekhana* action which helps in the removal of excessive lipids in circulation. *Shilajitu* possess *Chedana*, *Medohara* and *Mehahara* properties. In addition it is also explained as a *Rasayana dravya* in diseases with *Avarana* pathology.[8] *Swarnamakshika* also has similar properties and actions as that of *Shilajitu. Lauha bhasma* is *Kapha-pittahara* having *Medohara, Mehahara* and *Rasayana* actions. It has *Lekhana* property which helps in removing the excessive fat.[9]

Chemical Composition Of Ingredients And Their Action On Dyslipidemia

Review of scientific publications regarding phytochemical and experimental studies conducted on ingredients of SL revealed the active constituents of each ingredient and their mode of action in the management of dyslipidemia. *Shilajitu* contains dibenzo-alpha-pyrones, dibenzo-alpha-pyrone-chromoproteins and fulvic acid. It exhibits antioxidant, immunomodulatory, anti-inflammatory, adaptogenic and antidyslipidemic activities.[10] Administration of *Shilajitu* for 45 days at a dose of 2 gms in human subjects showed significant reduction in TG, TC, LDL and VLDL levels and improved HDL levels.[11] Fulvic acid present in *Shilajitu* is beneficial in maintaining the optimum energy metabolism by which most of the excess calories consumed are burnt off and not converted in to fat. *Shilajitu* has hepatoprotective effects and lowers cholesterol and TG levels.

Honey contains flavonoides (such as api genin, pinocembrin, kaepferol, quercetin, galangin chrysin and heoperetin), phanolic acid (such as ellagie, caffieic, P-coumaric & ferulic acids) ascorbic acid, tocopherols, catalase, superoxide dismutase (SOD), reduced glutathione (GSH), Millard reaction products and peptide.[12] Natural honey at a higher dose of 300 mg showed significant reduction in serum TC, TG and LDL levels which was almost similar to that of atorvastatin.[13] Niacin is a normal constituent present in honey. It inhibits lipolysis in adipose tissue which results in decrease in hepatic TG synthesis. This in turn reduces TG, LDL and VLDL. Honey has low glycemic index which helps in reducing body weight and increases HDL.[14] *Z. officinale* contains bioactive molecules like zingerone, 6-gingerol, 8-gingerol, 10-gingerol, and 6-shogaol, which are responsible for the antioxidant, hypolipidemic, and antiatherosclerotic effects. *Z. officinale* extract treatment showed small LDL-C/HDL-C and TC/HDL-C ratios suggesting its antiatherogenic effects.[15] 400mg/kg body weight of aqueous ginger infusion is found to be more effective as a hypocholesterolemic agent than atorvastatin.[16] *P.longum* contains active principle ingredients such as piperine, methyl piperine, pipernonaline, piperettine, asarinine etc.[17] Piperine shows significant reduction in TC, TG, LDL-C levels. Piperine at a dose of 30 mg/kg body weight significantly reduced the adipocyte cell size by 53.01% in subcutaneous white adipose tissue (SAT) and 35.88% in visceral white adipose tissue (VAT). Piperine down-regulates lipid synthesis in visceral fat than in subcutaneous fat and up-regulates lipolysis in visceral fat. These processes lead to the reduction in TC, TG and LDL-C levels.[18] *P.nigrum* primarily (5-9%) contains an alkaloid amide called piperine.[19] Administration of black pepper (250 mg or 500 mg/kg body weight) and piperine (20 mg/kg body weight) to high fat diet fed rats shown significant reduction in TC, TG, LDL, plasma phospholipids, free fatty acids and elevated HDL levels.[20] Black pepper at low doses (0.5%) induces mild alterations in the metabolism of cholesterol by stimulating cholesterol-7α-hydroxylase activity.[21] Chalcopyrite contains copper not less than 5%, iron not less than 12% and sulphur not less than 20%. It shows significant reduction in TC, TG, VLDL levels.[22] Administration of *swarnamakshika bhasma* in therapeutic dose for 30 days showed significant increase in Hb% and significant decrease in TC, TG and VLDL levels.[23] Lauha bhasma contains metallic iron which is converted into iron oxide (Fe_2O_3). Iron in ferrous form (Fe^{2+}) is found to be more beneficial than ferric form (Fe^{3+}) as Fe^{2+} is better absorbed.[24] *Triphala kwatha* (decoction of *triphala*) is used in the preparation of *lauha bhasma.* Ascorbic acid in *triphala* increases the bioavailability of iron by converting Fe^{3+} to Fe^{2+}.[25]

CONCLUSION

SL, by the virtue of its *Rasapanchaka* and chemical constituents possess significant effect in management of dyslipidemia. On the basis of *Rasapanchaka*, it acts at both *Koshta* and *Dhatu* levels. It corrects the *Agni*, pacifies *Kapha-vata doshas* and thus clears the *Srotodushti* in *Medavaha srotas*. This helps in preventing excessive formation of *Meda*. *Lekhana, Chedana* properties of the ingredients helps in removal of excessive *Meda* from the body. Ingredients of SL possess hypolipidemic activities through various mechanisms which help in lowering the lipoprotein levels. It also helps in preventing the progression of dyslipidemia and complications by antioxidant and free radical scavenging activities. Hence SL can be considered and practiced as an effective therapy for dyslipidemia for which further clinical trials need to be conducted.

Conflict Of Interest

Nil

Acknowledgement

I extend my gratitude to my PhD guide Dr Shrilatha KamathT and other faculty members for their valuable guidance and support.

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