



Review Article

A CRITICAL REVIEW ON THE IMPACT OF AYURVEDIC DIETETICS (PATHYA APATHYA) IN THE MANAGEMENT OF DYSLIPIDEMIA

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ABSTRACT
Dyslipidemia is defined as abnormal amount of lipids in the blood. It is a metabolic disorder, manifested as increased plasma levels of total cholesterol, triglyceride or a decrease in high density lipoprotein. Dyslipidemia is the main disposing factor for the atherosclerosis, and the atherosclerosis is the main pathogenesis factor for cardiovascular disease. In Ayurvedic view, dyslipidemia can be considered similar to aggravated *Dusta Meda Dhatu* in the body which is caused due to hypofunction of *Medo-Dhatwagni* leading to *Medovaha Srotodusti Vikara*. *Nidanparivarjana* is the main treatment principle of Ayurveda.
For dyslipidemia, diet which is *Laghu*, *Ruksha*, *Kaphamedohara* and *Srotoshodhana* property should be followed. While, *Guru*, *Snigdha*, *Kaphamedokara* and *Abhishyandhi* food should be avoided. According to *Bhaisjya Ratnawali*, *Pathya* for *Hridroga* are *Dadima*, *Shunthi*, *Yavani*, *Patol* etc while *Apathya* are *Ksheer Vikruti*, *Dadhi*, *Guru Bhojan* etc. Using healthy diet rich in complex carbohydrates, vegetables, and fruits seasoned with adequate quantity of spices with minimum amount of oils and fats are ideal for management and prevention of dyslipidemia. So this research article, will explain the properties of *Pathya* and *Apathya* their mode of action in prevention and management of dyslipidemia with the help of previous research work done on related *Pathya Apathya* food article.

INTRODUCTION

Dyslipidemia is the imbalance of lipids such as cholesterol, low-density lipoprotein cholesterol which is considered as one of the risk factor of the development of CVDs. Cardiovascular diseases are the leading cause of death worldwide.^[1] Together CVD resulted in 17.9 million deaths (32.1%) in 2015, up from 12.3 million (25.8%) in 1990.^[2] It is estimated that dietary risk factors are associated with 53% of CVD deaths.^[3] Dyslipidemia is the main causative factor for the Atherosclerosis, and the Atherosclerosis is the main pathogenesis factor for Cardiovascular diseases.

In Ayurvedic view, Dyslipidemia can be compared with *Dusta Meda Dhatu* in the body which is caused due to *hypo-function* of *Medo-Dhatwagni* leads

to quantitatively excessive homologous *Poshak Medodhatu* or *Asthayi Medodhatu* in circulation. As it is said that "Prevention is better than cure" so with *Pathya Aahara* and *Vihar* prevention and management of dyslipidemia can be done. The lifestyle modification and diet is a part of the management for dyslipidemia, regardless of pharmacologic intervention. The management of dyslipidemia is not satisfactory in modern science because of prolong use of modern medicine and their side effects, so there should be an alternative. Hence, it is a need of an hour to explore *Pathya Aahara* that could be able to prevent such conditions and its side effects. In Ayurveda, *Pathya* is itself considered as a medicine which will help in prevention and cure of dyslipidemia.

MATERIALS AND METHODS

Thorough literary search done on various Ayurveda classics for various *Pathya* and *Apathya Aahara Vihar* and research evidences was reviewed. Dyslipidemia discussed according to Ayurveda & modern system of medicine. Properties of *Pathya Apathya Aahar* and their pharmacological action was reviewed as per research evidences.

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Types and Causative Factors of Dyslipidemia

Primary Dyslipidemia: Mostly have genetic relation.

- Familial combined hyperlipidemia
- Familial hypertriglyceridemia
- Homozygous familial or polygenic hypercholesterolemia

Secondary Dyslipidemia: Develops due to environmental factors.

- Obesity
- Diabetes
- Hypothyroidism
- Alcoholism
- Polycystic ovary syndrome
- Metabolic syndrome
- Cushing syndrome
- Severe infection such as, HIV

Risk Factors [4]

- Family history of dyslipidemia
- Current cigarette smoking
- Diabetes mellitus
- Hypertension
- Obesity (BMI>30kg/m2)
- Atherosclerosis
- Chronic kidney disease (eGFR <60ml/min/1.73m2)
- Chronic obstructive pulmonary disease
- Clinical manifestations of hyperlipidemias (xanthelasma, xanthomas)
- Hypertensive disorders of pregnancy
- Inflammatory bowel disease
- Dyslipidemia: Ayurveda View

There is no direct reference of Dyslipidemia in Ayurvedic classics. It can be included under

Ayurvedic Dietetics for control of Dyslipidemia[7]

santarpanjanya vyadhis "Medoroga". In many research studies hyperlipidemia is termed by different nomenclature, e.g. *Rasagata Sneha Vriddhi* (increase in lipids in plasma), *Rasa Raktagata Sneha Vriddhi* (increase in the lipids in plasma and blood), *Medovriddhi* (generalized lipid increase), *Medoroga or Medodosha* (obesity), *Aam Medo Dhatu* (abnormally formed adipose tissue).[5]

When there is derangement of *Medodhatwagni*, then it will lead to excess accumulation of abnormal quantities of *Poshakamedodathu* in *Rasa*. This excess accumulation of abnormal quantities of *Poshakamedodathu* in *Rasa Dhatu* resembles hyperlipidaemia of modern medicine. The consequence of such increase in *Poshakamedodathu* leads to disorders such as *Dhamanipratichaya* described by *Acharya Charak* in *Kaphajananatmajavyadhi*. [6]

Specific Pathya and Apathya Aahara-Vihara for the Management of Dyslipidemia

The concept of *Pathya* and *Apathya* is the peculiarity of Ayurveda. *Pathya* & *Apathya* are defined as the substance or regime which does not adversely affect the body and mind are regarded as *Pathya*, those which adversely affect them are considered to be *Apathya*.

Pathya mentioned for *Hridroga* in various *Samhita* can be used in Dyslipidemia. As dyslipidemia is a disease of *Medo Dushti* so the *Pathya Apathya* those are mentioned in Ayurveda classics for *Prameha* and *Medoroga* could be used here also.

Pathya Aahara classified here are according to therapeutic effect at various level of *Samprapti Ghatak* in management of dyslipidemia (*Medo Roga*).

Table 1: Pathya & Apathya Aahara

Pathya Aahara (Do's)	Apathya Aahara (Don'ts)
<i>Rakta Shali, Takra</i>	<i>Aavi Dugdh</i>
<i>Patola, kushmand, Shunthi, Vilepi</i>	<i>Madhuka</i>
<i>Kadli phala, Dadima, Draksha, Haritki</i>	<i>Virrudha Anna</i>
<i>Yavani, Lasuna, Purana Madhu, Ardrak,</i>	<i>Guru Paki Aahara</i>
<i>Purana Gud, Saindhav lavan, Mulak</i>	<i>Puran Patra Shaka</i>
<i>Mudga yusha, Kullatha yushsa,</i>	<i>Naveen Anna, Ksheer-Ikshu Vikrati</i>
<i>Kodo, Katu Tikta Kashaya Dravya, Sarshap Taila, Ela Patra Shaka, Ushan Jala, consumption of water before food</i> [8]	<i>Madhura Dravya, consumption of water after food, Matsya, Mansa</i>
<i>Chandan panak, Kasturi panak</i>	<i>Dadhi, Pishta Anna, Abhisyandi Padarth</i> [9]

Specific Regimen for control of Dyslipidemia[10]

Table 2: Pathya & Apathya Vihar

Pathya vihar	Apathya vihar
<i>Swedana, Vaman, Virechan, Lekhana Basti, Langhan</i>	<i>Trishana, Mala Mutradi Vegadharan</i>
<i>Yoga</i>	<i>Dant Dhawana</i>
<i>Pranayam, Meditation, Agaru lepa</i> [11]	<i>Rakta Mokshana, Diwaswapna,</i>

Properties of Pathya Aahara (specific food Items) described for management of Dyslipidemia^[12]**Table 3: Pathya Aahara & their properties**

Pathya	Properties
<i>Dadima</i>	<i>Madhura rasa, Tridoshagna, Hridya, Deepan</i>
<i>Shunthi</i>	<i>Katu Rasa, Madhura Vipaka, Ushna Kapaha Vatahara</i>
<i>Yava</i>	<i>Kashaya Rasa, sheeta, Kapha Pitta hara, Lekhana</i>
<i>Madhu</i>	<i>Madhura kashaya, Ruksha, Hridya, Kapha Medohara</i>
<i>Kushmand</i>	<i>Ushana virya, Tridoshagna, Hridya, Deepan</i>
<i>Rasona</i>	<i>Madhura katu, Ushna, Hridroga nashak, Kaphagna</i>
<i>Saindhav Lavan</i>	<i>Madhura, Sheeta Virya, Laghu, Tridoshagna, Hridya, Deepan</i>
<i>Takra</i>	<i>Madhura Amla, Ushna, Kapha Medohagna, Hridya</i>
<i>Erand tail</i>	<i>Madhura, Ushna, Srotovishodhana, Deepan</i>
<i>Patol</i>	<i>Pachan, Hridya, Deepan, Ushna,</i>
<i>Purana Ghrita</i>	<i>Katu Tikta Rasa, Lekhan, Tridoshagna</i>
<i>Yavani</i>	<i>Tikshan, Ushan, Deepan pachan, Kapha Vata hara</i>
<i>Vilepi</i>	<i>Deepani, Hridya, Grahi, Laghu, Madhura Rasa</i>
<i>Rakta Shali</i>	<i>Deepan, Mutral, Hridya, Tridoshagna</i>
<i>Ardrak</i>	<i>Kapha-Vatahara, Hridya, Ushna, Katu Rasa, Katu Vipaka</i>
<i>Mulak</i>	<i>Katu-Tikta Rasa, Hridya, Rochan, Deepan, Sarva Dosh hara</i>
<i>Sarshap Tail</i>	<i>Laghu, Kapha-Medo-Anil Hara, Lekhan, Katu, Deepan</i>
<i>Haritki</i>	<i>Ushan, Kashay, Amla, Deepan, Bhedan, Laghu, Ruksha</i>
<i>Ushan Jala</i>	<i>Kapha-Medo-Vata Roga Nashak, Aam Nashak, Deepan</i>
<i>Mudga Yusha</i>	<i>Kapha Nashak, Agni Deepak, Hridya</i>

Pathya mentioned here are mainly cardioprotective and have anti-hyperlipidemic property established in various clinical and experimental researches.

Food not to be used (Apathya Aahara) in management of Dyslipidemia^[13]

Apathya Aahar Dravya such as *Dadhi* is *Kapha-Meda Karak, Guru, Snigdha, Abhisyanidi. Guru, Snigdha Guna* will cause *Agni Mandya* and *Abhisyanidi Guna* will lead to *Srotoavrodh* further there will be *Medodhatwagni Mandya* so there will be excessive *Poshak Medo Dhatu*.

Aavi Dugdh should be avoided in dyslipidemia as it is *Madhur, Snigdha, Guru, Kapha-Pitta karak*. As *Madhur Rasa, Snigdha & Guru Guna* will cause the vitiation of *Kapha- Meda & Sroto-avrodh* will occur.

Madhuka is specifically considered as *Ahridya* so it is not good for heart also it is *Guru* and cause the vitiation of *kapha*. Hence it is regarded as *Apathya* in dyslipidemia.

Ksheer Vikruti is *Vishtambh, Guru* which leads to *Agni Mandya* and hence *Aam* formation will be there, also it causes the vitiation of *Kapha*.

Physical Activity in Management of Dyslipidemia

Physical activity is an excellent choice for patient with mild to moderate elevation in cholesterol because of the multiple and long term benefits. The World Health Organization (WHO) states that

substantial health benefits, for CVD risk reduction, can be achieved by moderate-intensity physical activity of at least 150 minutes a week, or vigorous-intensity physical activity of at least 75 minutes a week, or any combination of moderate and vigorous-intensity PA. It is also emphasises that any amount of PA leads to health benefits.^[14]

ACSM recommends adults with dyslipidemia to perform moderate to vigorous intensity aerobic exercise 30 to 60 minutes per day. These kind of physical activity recommended in various lifestyle diseases because these physical activity will increase metabolic rate, and helps in reduction of fat and central obesity which is responsible for this disease.

Study conducted by Ali M. Albarrati on Effectiveness of Low to Moderate Physical Exercise Training on the Level of Low-Density Lipoproteins which indicates that aerobic exercise of both low and moderate intensity resulted in a significant reduction of total cholesterol. At the same time, exercise improved the health status and physical fitness of all the participants in the included studies.^[15]

Dyslipidemia as a Risk of Cardio Vascular Diseases

1. Study conducted by Rea Ariyanti et al on dyslipidemia associated with hypertension increases the risks for Coronary Heart Diseases: A case control study which indicates that in hypertensive respondents those with Dyslipidemia

- was 18.1 times more likely to develop coronary heart disease compared with non-dyslipidemic.^[16]
- Study conducted by Mahshad Hedayatnia et al on Dyslipidemia and cardiovascular disease risk among the MASHAD population which shows that total cholesterol baseline level was significantly associated with risk of Myocardial infarction among men.^[17]
 - Study conducted by Abo Bakr Omar Hussain et.al on Association between Ischemic Heart Disease and Dyslipidemia among adult Hypertensive patients which indicates that the combination of hypertension and dyslipidemia is a significant risk of Ischemic heart disease for male gender, obese, diabetes, or smoker.^[18]
 - Study conducted by Benoi Lamarche et.al on prevalence of dyslipidemic phenotypes in Ischemic heart disease which confirm the importance of both elevated plasma cholesterol and decreased HDL cholesterol levels as a risk factor for ischemic heart disease.^[19]
 - Study conducted by Syed Nauman Ali et.al on pattern of dyslipidemia in young patients with acute ST elevation myocardial infarction which concluded that there is high frequency of dyslipidemia in young patients presenting with acute myocardial infarction.^[20]

Table 4: Food Articles and their Properties According to Research Evidences

S.No.	Aahara Dravya	Botanical name	Properties	Reference
1.	Yavani	<i>Trachyspermum ammi</i>	Antioxidant, antihyperlipidemic, hepato and nephro-protective effect	Saleem U et.al. ^[21]
2.	Kadliphala	<i>Musa paradisiaca</i>	hepato- protective and antihyperlipidemic activity.	Adekiya T et.al. ^[22]
3.	Ardrak	<i>Zingiber officinale</i>	ginger has significant lipid lowering effect	Alizadeh N et.al. ^[23]
4.	Patol	<i>Trichosanthes dioica</i>	Antioxidant properties, scavenges free radicals, anti-hyperlipidemic, anti-diabetic activity.	Shrivastava AK et.al. ^[24]
5.	Rasona	<i>Allium sativum</i>	Aqueous extract possess significant hypolipidemic activity and the decrease in the elevated levels of the fat was also observed	Narkhede R R. et al. ^[25]
6.	Dadima	<i>Punica granatum</i>	Crude powder of <i>Punica granatum</i> husk reduced the concentration of glucose, triglycerides, cholesterol, LDL cholesterol, VLDL cholesterol and raised the level of HDL cholesterol and hemoglobin content	Radhika S. et.al. ^[26]
7.	Yava	<i>Hordeum vulgare</i>	High-dose whole-grain highland hull-less barley has antihyperlipidemic activity.	Xia X et.al. ^[27]
8.	Kushmand	<i>Benincasa hispida</i>	Antiobesity, antihyperlipidemic, antioxidant, antiulcer, diuretic activity	Ayubkhan N et.al. ^[28]
9.	Haritaki	<i>Terminalia chebula</i>	Reduction in total cholesterol, triglyceride, total protein & elevation of HDL	V Maruthappan et.al. ^[29]
10.	Mulak	<i>Raphanus Sativus</i>	Anti-atherosclerotic effect	Jinhyuk Na et.al. ^[30]
11.	Ela	<i>Elettaria Cardamomum</i>	Reduction in blood total cholesterol, LDL, Triglyceride	Shamarao N et.al. ^[31]
12.	Sarshap Tail	Mustard oil	Reduction in body weight, Lipid profile, and atherogenic index	Khalid G et.al. ^[32]

DISCUSSION

Dyslipidemia is a metabolic disorder related to abnormal fat metabolism. It is one of the risk factors which cause atherosclerosis, stroke and cardiovascular diseases (CVDs). But it can be prevented by adopting healthy dietary habits and lifestyle. For the prevention of cardiac diseases screening for early detection of high blood lipids is recommended by American Association of Clinical Endocrinologist. According to

Ayurveda it can be correlated with *Dushta Meda Dhatu*. So, the *Pathya* useful in dyslipidemia might have the properties such as *Deepan, Pachan, Ushna Virya, Ruksha, Tikshana, Srotoshodhana, Hridya, Lekhan, Kaphaghna* and having *Medo Nashak* property.

Pathya Aahara Dravya such as *Yavani, Rasona, Shunthi, Erand Tail* are *Katu Rasa, Usna Virya, Tikshna Guna. Katu Rasa* is *Ushna tikshna* and has the property

of *Srotoshodhan*. Because of this property *Kapha Dosh* and *Meda* will reduce which is mainly aggravated in dyslipidemia. Pharmacological studies on *Yavani* also reveal its antihyperlipidemic, antioxidant hepato and nephro-protective effect which confirm its beneficial use in dyslipidemia. Pharmacological studies on *Rasona* also reveal its antihyperlipidemic activity and body weight reduction was observed.

Purana Ghrita is *Katu Tikta Rasa Pradhan Tridoshagna*, *Yava* is *Kashaya Rasa, sheeta, Kapha Pitta hara, Lekhana*. *Purana Ghrita* and *Yava* will cause *Lekhan* of *Kapha* and *Meda* which confirms their utility in dyslipidemia. Pharmacological studies on *Yava* also reveal its anti-hyperlipidemic activity.

Dadima is *Madhura, Amla, Hridya, Ushna*. As *Amla Rasa* is *Prithvi* and *Agni Mahabhuta Pradhan* so it is *Agni Deepan* and *Kapha Shamak* which will help in Dyslipidemia. Pharmacological studies on *Dadima* also reveal its anti-hyperlipidemic activity, helps to reduce the concentration of glucose, and raise the level of HDL cholesterol and hemoglobin content.

Sarshap Tail is *Laghu, Kapha-Medo-Anil Hara, Lekhan, Katu, Deepan*. So this will help in *Lekhan* and reduction of *Kapha* & *Meda*. Pharmacological studies on *Sarshap Tail* also reveal its antihyperlipidemic activity, Reduction in body weight, and atherogenic index.

Haritaki is *Ushan, Kashay, Amla, Deepan, Bhedan, Laghu, Ruksha*. It has *Rukshaneeya* effect which will reduce vitiation of *Kapha* and *Meda*. Pharmacological studies show its effect in reduction of total cholesterol, triglyceride, total protein and elevation of HDL Hence effective in dyslipidemia.

S. Karpagam Kumara Sundari *et al.* conducted a study on Antihyperlipidemic activity of fresh juice of *Benincasa hispida* cogn. which showed significant reduction of cholesterol, triglyceride, LDL, VLDL and increased the HDL level. It also showed significant effect on body weight reduction.^[33]

Patola is *Tikta Rasa Pradhan* it is *Laghu, Ruksha*. It has *Rukshaneeya* effect which will reduce vitiation of *Kapha* and *Meda* which in turn cause reduction in total cholesterol. Pharmacological studies on *Patola* also reveals its anti-hyperlipidemic activity Antioxidant properties, scavenges free radicals and anti-diabetic activity.

Sharma G *et al.* have showed influence of alcoholic extract of whole fruit of *T. dioica* on blood sugar, serum lipids, lipoproteins, and fecal sterols in normal albino rabbits. It was observed that this extract lowered the blood sugar, total cholesterol, low density lipoprotein cholesterol, and triglyceride levels and increased high density lipoprotein cholesterol, phospholipid.^[34]

Dravya such as *Dadima, Kushmand, Takra* etc are *Hridya* so these worked as cardio protective to control Dyslipidemia.

CONCLUSION

Each *Aahara Dravya* has specific pharmacological actions like, some act on *Agni Deepan Pachana*, some on *Srotoshodhana* property, some directly act on *Medo Dhatu*. This study provide lipid lowering *Pathya Aahara Vihar* in prevention and management of dyslipidemia as per Ayurveda and research evidences. It can be concluded that Diet and lifestyle modification can be helpful to manage such type of diseases and prevent their side effects.

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