

**MEDOROGA AND DYSLIPIDEMIA****<sup>1</sup> Kadlaskar Bharat Bansi <sup>2</sup> Salunkhe Snehalata Sagar <sup>3</sup> Salunkhe Sagar Nanasaheb**<sup>1</sup>Professor, Department of Kayachikitsa B.V.D.U. College of Ayurved, Pune-411043<sup>2</sup>Assistant Professor, Department of Kayachikitsa B.V.D.U. College of Ayurved, Pune-411043<sup>3</sup>Associate Professor, Department of Biochemistry B.V.D.U. Medical College, Pune-411043**ABSTRACT**

Dyslipidemia involves abnormally elevated levels of any or all lipids and/or lipoproteins in the blood. It can be included under *Santarpanjanya vyadhi* as “*Medoroga*”. In our body, there are many tissues which are rich in lipids such as *Medodhatu*, *Vasa* and *Majjadhathu*. Among the above lipids; *medodathu* is very important, as it has significant role in developing many metabolic disorders. The pathology- it is a condition caused by derangement of *agni*, leads to *aamarasa*, *aama* causes *Medodhatwagnimandya*; which leads to excess homologues *Poshaka Medodhatu* in circulation, which can be referred to the conditions such as Dyslipidemia.

Hyperlipidemia a broad term, also called hyperlipoproteinemia, is a common disorder in developed countries and is the major cause of coronary heart disease and stroke.

Dyslipidemia in general has no apparent symptoms and can diagnosed during routine examination. The high costs and side effects of hyperlipidemia medications have led many people to search for alternate treatments. Therefore there is need to evaluate herbal formulations for the treatment of dyslipidemia.

Key Words: Dyslipidemia, *Santarpanjanya*, *Medoroga*

**INTRODUCTION:**

Ayurveda is being increasingly accepted by world for its relevance and adaptability to modern times. An important concept of ayurveda is that each individual is genetically different; this gives him a very specific constitution and also a very individual way of interacting with the environment. To promote health each individual must modify his lifestyle to optimize bodily functions.

In modern era every person is running after life's goal, hence does not have time to think, act for healthy life and not

able to follow proper *Dincharya*, *Ritucharya*, Dietetic Rules and Regulations. The industrialization, stress, lack of exercise and various varieties of food in daily diet e.g. Fast food, frizzed fruits, soft drinks and beverages, canned foods may results into clinical entity which we can say as *Medoroga*. Due to *Medodhatu dushti* -- *Sthoulya*, *Prameha*, *Kushtha* etc may develop whose prevalence has increased drastically over a past few decades. In Ayurveda, there is no direct reference of a single disease entity that can be directly correlated with the Dyslipidemia. Moreover different

scholars have different opinions about the nearest possible disease. Most of them have considered hyperlipidemia under the heading of *Medoroga* or *Medodosha*. Few of them have considered as *Rasagata-Snehavridhi*, *Raktagata-Snehavridhi* or *Rasa Raktagata-Snehavridhi*, whereas some are considering hyperlipidemia under the broad umbrella of *Aama*.

Dyslipidemia is major risk factor for Cardio Vascular Diseases (CVD), Cerebro – Vascular - Episode (CVE), Peripheral-Vascular-Disorders, etc. Over the last two decades there has been an increasing emphasis placed on screening for high cholesterol and adopting interventions to reduce cholesterol levels in order to reduce the risk of above diseases.

Cholesterol lowering drugs available in the market without stabilizing the artery wall aggravates the problem because cholesterol lowering drugs decrease the body repair factors, without stabilizing the vascular wall. <sup>[1]</sup> Most of the drugs (statins) available today are inhibitors of 3-hydroxy-3-methylglutarylcoenzyme a reductase, which is involved in cholesterol biosynthesis in the liver. The mechanism precisely known is that they inhibit the key enzyme of cholesterol synthesis, HMG Co-A reductase but have severe deadly side effects. <sup>[2]</sup> This has led to a search for more natural methods to control cholesterol levels.

## CONCEPTUAL REVIEW

### 1.0 LIPIDS

		Desirable	Borderline	High Risk
1.	Total cholesterol	< 200 mg/Dl	200-239 mg/dL	≥240 mg/dL
2.	LDL-C	≥130 mg/Dl	130-159 mg/dL	160-189 mg/dL
3.	HDL-C- Males	< 40 mg/dL	35- 45 mg/dL	

Lipids are essential to life, but an excess of certain lipids can increase the risk for cardiovascular disease.

Cholesterol is a lipid that is present in cell membranes and is the precursor for steroid hormones and bile acids. Cholesterol is found in the blood in distinct particles containing both lipids and proteins, and the particles are called lipoproteins. Lipoproteins found in humans are divided into classes according to their flotation constants or densities. Three major classes are found:

Low- Density Lipoproteins (LDL),

High- Density Lipoproteins (HDL), and

Very- Low- Density Lipoproteins (VLDL).

**LDL** cholesterol contains cholesterol and a single protein or apolipoprotein, apoB-100. LDL constitutes about 60% to 70% of total serum cholesterol. LDL is the major atherogenic lipoprotein, and is the primary target for cholesterol lowering therapy.

**HDL** contains cholesterol and apo A I and apo A II apolipoproteins. HDL constitutes, about 20% to 30% of total serum cholesterol. HDL is thought to protect against the development of atherosclerosis.

**Triglycerides** are transported in the blood as chylo-microns following absorption from the small intestine, or as a component of VLDL if synthesized by the liver.

**In dyslipidemia**, the level of one or more of these lipids is abnormal (either too high or too low).

According to **Adult Treatment Panel III** (2001) <sup>[3]</sup>

	Females	<50 mg/Dl		
4.	Triglycerides	>150 mg/ dL	150- 199 mg/dL	200-499 mg/dL
5.	Blood Pressure	≥140/≥90 mmHg		
6.	Waist Males	>102 cm		
7.	Circumference Females	> 88 cm		
8.	Fasting Plasma Glucose	>110 mg/dL		

Overweight:

- BMI  $\geq$  85<sup>th</sup> % and  $<$  95<sup>th</sup> % for age and gender.

### 1.1 DYSLIPIDEMIA <sup>[4]</sup>

Dyslipidemia is abnormal levels of lipids (cholesterol, triglycerides, or both) carried by lipoproteins in the blood. This term includes hyperlipoproteinemia (hyperlipidemia), which refers to abnormally high levels of total cholesterol, LDL—the bad—cholesterol, or triglycerides, as well as an abnormally low level of HDL—the good—cholesterol.

#### 1.1.1 Prevalence of Dyslipidemia <sup>[5]</sup>

- The prevalence of dyslipidemia is observed to be higher in males than in females.
- Total Cholesterol concentration  $\geq$  200mg/dl, 38.7% are males and 23.3% are females.
- HDL-C is abnormally low in 64.2% males and 33.8% in females.
- The increase of prevalence of hypercholesterolemia and hypertriglyceridemia is more prominent in 31 - 40 age group than in  $\leq$  30 age group.

#### 1.1.2 Primary causes : <sup>[4]</sup>

Primary causes are single or multiple genetic mutations that result in either overproduction or defective clearance of TG and LDL cholesterol or in underproduction or excessive clearance of HDL. Primary lipid disorders are suspected when a patient has physical signs of dyslipidemia, onset of premature

atherosclerotic disease ( $<$  60 yrs), a family history of atherosclerotic disease, or serum cholesterol  $>$  240 mg/ dl.

#### 1.1.3 Secondary causes : <sup>[4]</sup>

Secondary causes contribute to many cases of dyslipidemia in adults. The most important secondary cause in developed countries is a sedentary lifestyle with excessive dietary intake of saturated fat, cholesterol, and trans fats. Trans fats are polyunsaturated or monounsaturated fatty acids to which hydrogen atoms have been added; they are commonly used in many processed foods and are as atherogenic as saturated fat.

Other common secondary causes include diabetes mellitus, alcohol overuse, chronic kidney disease, hypothyroidism, primary biliary cirrhosis and other cholestatic liver diseases, and drugs, such as thiazides,  $\beta$ -blockers, retinoids, highly active antiretroviral agents, cyclosporine, tacrolimus, estrogen and progestins, and glucocorticoids.

Secondary causes of low levels of HDL cholesterol include cigarette smoking, anabolic steroids, HIV infection, and nephritic syndrome.

#### 1.1.4 Symptoms and Sign: <sup>[4]</sup>

Dyslipidemia itself usually causes no symptoms but can lead to symptomatic vascular disease, including coronary artery disease (CAD), stroke, and peripheral arterial disease.

- High levels of TGs (> 1000 mg/dL ) can cause acute pancreatitis.
- High levels of LDL can cause arcuscorneae and tendinousxanthomas at the Achilles, elbow, and knee tendons and over metacarpophalangeal joints.
- Patients with the homozygous form of familial hypercholesterolemia may have the above findings plus planar or tuberous xanthomas.
- Patients with severe elevations of TGs can have eruptive xanthomas over the trunk, back, elbows, buttocks, knees, hands, and feet.
- Severe hypertriglyceridemia (> 2000 mg/dL) can give retinal arteries and veins a creamy white appearance (lipemiaretinalis).
- Extremely high lipid levels also give a lactescent (milky) appearance to blood plasma. Symptoms can include paresthesias, dyspnea, and confusion.

#### 1.1.5 Treatment

- Eat well balanced diet: include decreasing intake of saturated fats and cholesterol;
- Increasing the proportion of dietary fiber, and complex carbohydrates, e.g. Whole grains, fruits, vegetables, etc.
- Weight Management
- Exercise Regularly : Exercise for at least 30 minutes every day, i.e. walking, yoga, dancing Quit smoking: to reduce the risk of heart disease and stroke.
- Medicines / Drug Treatment :

The **National Cholesterol Education Program** (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treat-

ment Panel III) reinforced LDL as the primary target of cholesterol - lowering therapy with the optimal goal of its level below 100 mg/dL.<sup>[4]</sup>

‘Statins’ are usually recommended as they reduce LDL cholesterol by up to 60 % and produce small increase in HDL and modest decrease in TGs. . Bile acid sequestrates (cholestyramine; colestipol [Colestid]), nicotinic acid (crystalline, timed-release preparations, extended release nicotinic acid [Niaspan]), and fabric acid derivatives ( gemfibrozil [Loped]); fenofibrate (TRICOR) are alternative therapies.<sup>[4]</sup>

**2.0 CONCEPT OF LIPIDS IN AYURVEDA:** In our body, there are many tissues which are rich in lipids. All these structures have *Sneha* (oiliness) as common feature. They are *MedoDhatu*, *Vasa* and *MajjaDhatu*. All these three have *Snehatwa* as common feature but all the three differ in their site and function.<sup>[6]</sup> But importance is given to *MedoDhatu* which is having significant role in developing many metabolic disorders like *Medoroga*, *Prameha* etc.

There are two types of *MedoDhatu*. One is *Poshaka* (Nutrients) and second is *Poshya* (Nourish). Among these , *Poshaka MedoDhatu* is *Gatiyukta* (mobile in nature) which is circulated in the whole body along with the *Rasa - Rakta Dhatu*, to give nutrition to *Poshya MedoDhatu*. Through different imaging techniques it can be visualized that lipids along with the cholesterol are being circulated with the blood.

Second, *Poshya MedoDhatu* is *Gativivarjita* (immobile in nature), which is stored in

*Medodharakala*. The site of *Medodharakala* is *Udara, Anuasthi, Sphika, Stana* and *Gala*.

### 2.1 Concept of Cholesterol in Ayurveda

Ayurveda emphasizes the importance of metabolic processes in health promotion as well as disease management. “*Agni*” is the term used in Ayurveda for defining collectively all the bodily metabolic actions.

The vitiation of *Agni* has serious impact on health at various levels depending on type of *Agni* involved.

Ayurveda classifies *agni* into several varieties: *JATHARA AGNI* – located in the alimentary tract and performing major metabolic processes, *DHATU AGNI* – situated at tissue levels and capable of processing metabolic requirements of individual tissues, and *BHOOTA AGNI* – subtle metabolic processes that happen at the cellular level.<sup>[7]</sup> Metabolic processes maintain the normal quantity, quality and

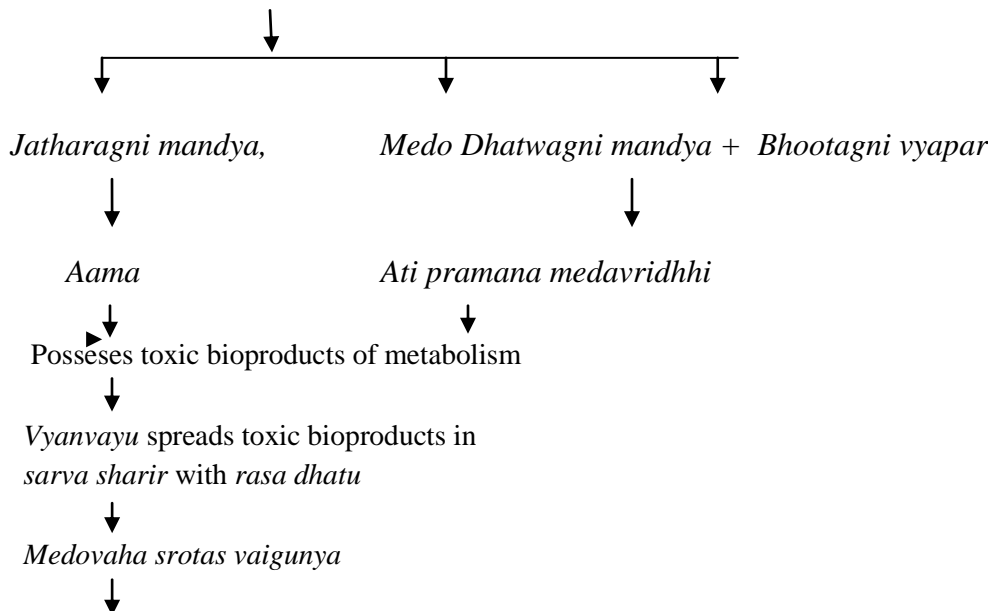
function of the dosha and dhatu. When in abnormal states due to various causative factors relating to body and the mind; metabolites that are not assimilated by the body tissues will be produced. The resultant product of such metabolic action is called *aama*. *Aama* is the primary cause of all metabolic disorders in Ayurveda. The accumulation of *Aama* could be compared with the accumulation of lipofusins, amyloid bodies, modified proteins and lipids, which are not suitable for further metabolism, by the normal cellular pathway. There is no precise term for dyslipidemia in the Ayurvedic classics. Study of dyslipidemia reveals its similarity to *Asthayi Medo Dhatu Vriddhi* (abnormal increase in circulating lipids) with regard to the patho-physiology. This excessively increased circulating lipid is *aama* in nature, resulting in further complications.<sup>[8]</sup>

### 2.2 Pathology of Dyslipidemia According to Ayurveda:

*Atisnigdha , madhur , adhyashan, atimatra ahara*

*Avyayama, achinta, Diwaswapna*

*Beeja swabhavaj*



Accumulation of abnormal *poshak medodhatu* in *rasa*



Incomplete assimilation of *sthayi medodhatu* → leads to medoroga

### 2.3 Ayurvedic Treatment Principles for Managing dyslipidemia:

The Ayurvedic approach to dyslipidemia involves methods to increase the power of *agni* to digest the *aama*, regulating assimilation, elimination and controlling the causative factors.<sup>[9]</sup> Several individual herbs and combinations of herbs are used in Ayurveda for the management of *Medo Dhatu Vriddhi* (increased lipids), *aama* and metabolic disorders.<sup>[10]</sup>

- **Nidan Parivarjana:** All the nidan (etiological factors) mentioned should be avoided.

- **Samshodhan Therapy**

**Basti :** *Ruksha, Ushna, Tikshna basti* are suggested for *santarpanjanya roga*

#### Etiological factors

According to Modern	According to Ayurved
Intake of high fat diet	<i>Medyanna - Atisevana</i>
Lack of exercise	<i>Avyayama</i>
Sedentary life style	<i>Divaswapna- Achintana</i>
Genetic predisposition	<i>Bijaswabhaba</i>

- **Clinical Features**

According to Modern	According to Ayurved
Excessive deposition of fat in abdomen, waist, buttock etc	<i>Sphik, udara, parshva, sthanapradeshi Ati medavridhi</i>
Excessive appetite	<i>Ksudaatimatra</i>
Exertional dyspnea	<i>Kshudrashwasa</i>
Excessive perspiration	<i>Atisweda</i>
General weakness	<i>Dourbalya</i>

- **Complications**

According to Modern	According to Ayurved
Decreased life expectancy	<i>Ayusho-Hrahsa</i>
Mechanical disabilities	<i>Javaprodha</i>
Loss of immunity	<i>Alpaprana</i>
Cardiovascular and cerebrovascular manifestations	<i>Vata-vikara</i>

*chikitsa. Lekhan basti* is considered as the best therapy for *medovridhi*.

**Vaman-** *Yashtimadhu phanta, etc*

**Virechan-** *Haritaki, Katuki, Trivritta etc.*

**Raktamokshan**

**Nasya-** *Tripaladi Taila, etc.*

- **Samshaman Therapy**

**Langhana :** All ten types of *langhana* can use as per conditions.

Drugs having *deepan, pachan, rookshan, chedan, lekhan, teekshana, Ushna* properties to produce *srotovishodhan, ampachan* are useful. Especially *Shilajatu, Guggulu, Gomutra, Triphala, Loha Raj, Rasanjan, Madhu.*

### 3.0 Similarities between medoroga & lipid disorders:



## DISCUSSION

After studying the above comparison of the facts, it seems that dyslipidemia can be considered as *Medoroga*. No separate disease in the name of *Medoroga* is described in *CharakaSamhita*, but *Atisthaulya* is mentioned under *Ashtauninditiya*, which is actually *Medoroga*.<sup>[11]</sup>

In *MadhavaNidan*, the term *Medoroga* is used while describing its etiology. Abnormal accumulation of *MedaDhatu* in body is known as *Medodushti*. *Medodushti* includes several numbers of other *Medovikaras*, which are collectively known as *Medoroga*.

This idea is supported by *Madhukoshakara*<sup>[12]</sup> and *Bhavmishra*<sup>[13]</sup> by describing separate chapter of *Medoroga*.

*Madhavakara* has described the disease under heading of *Medoroga* in 34<sup>th</sup> chapter and has used *Medasvina*<sup>[14]</sup>, *Atisthula*<sup>[15]</sup> and *sthula*<sup>[16]</sup> words as synonyms.

## CONCLUSION

Dyslipidemia involves abnormally elevated levels of any or all lipids and / or lipoproteins in the blood. In our body, there are many tissues which are rich in lipids such as *MedoDhatu*, *Vasa* and *MajjaDhatu*. Among the above lipids, vitiated *medodathu* has significant role in developing many metabolic disorders. Etiological factors and signs and symptoms mentioned for *medoroga* are almost similar to dyslipidemia. *Agni* is responsible for all metabolic activities of the body. The pathology – *Medhodhatwagnimandya* leads to excess homologues *Poshaka MedoDhatu* in circulation, which can be referred to the

conditions such as dyslipidemia. Treatment options depends on the specific lipid abnormality. Ayurvedic medicine has been used for thousands of years for the treatment of various metabolic disorders. However, few studies have been conducted to evaluate the effectiveness of Ayurveda herbal medicine formulae on hypercholesterolemia. Higher quality studies, such as randomized clinical trials, are lacking. Thus dyslipidemia may be correlated with *Medoroga* which are the conditions of *santarpanjanya vikaras* as explained in Ayurvedic classics.

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