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DYSLIPIDEMIA: AN AYURVEDIC APPROACH

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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 *Majja dhatu*. Among the above lipids; *Medo dathu* 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 *Medo dhatwagni mandya*; which leads to excess homologues *Poshaka Medo dhatu* in circulation, which can be referred to the conditions such as Dyslipidemia. Hyperlipidemia a broad term, also called hyper lipoproteinemia, 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 *Medodhatudushti* -- *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-Snehavriddhi*, *Raktagata-Snehavriddhi or Rasa Raktagata-Snehavriddhi*, 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.[1]Most of the drugs (statins) available today are inhibitors of 3-hydroxy-3-methylgluatarylcoenzyme a reductase, which is involved in cholesterol biosynthesis in the liver. [2] This has led to a search for more natural methods to control cholesterol levels.

CONCEPTUAL REVIEW:

1.0 LIPIDS: 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 apolipotrotein, 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 AI and apo AII 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)[3]

		Desirable	Borderline	High Risk
1.	Total cholesterol	< 200 mg/Dl	200-239 mg/dL	≥240mg/dL
2.	LDL-C	≥130 mg/Dl	130-159 mg/dL	160-189mg/dL
3.	HDL-C- Males Females	< 40 mg/dL <50 mg/Dl	35- 45 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≥85th% and <95 th% for age and gender.

1.1 Dyslipidemia[4]: Dyslipidemia is abnormal levels of lipids (cholesterol, triglycerides, or both) carried by

lipoproteins in the blood. This term includes hyper lipoproteinemia (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.

1.1.1Prevalence of Dyslipidemia[5]

- The prevalence of dyslipidemia is observed to be higher in males than in females.
- Total Cholesterol concentration ≥ 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 hyper triglyceridemia is more prominent in 31-40 age group than in ≤30 age group.

1.1.2Primary causes:[4]

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.

1.1.3Secondary causes:[4]

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.

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, β-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.

1.1.4Symptoms and Sign:[4]

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

1.1.5Treatment

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

'Statins' are usually recommended as they reduce LDL cholesterol by up to 60 % and produce small increase in HDL and modest decrease in TGs. [4]

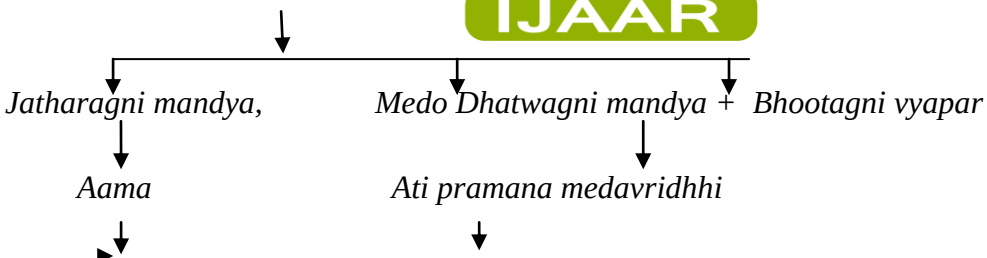
2.0 CONCEPTOFLIPIDS IN AYURVEDA: In our body, there are many tissues which are rich in lipids. All

these structures have *Sneha* (oiliness) as common feature. They are *Medo Dhatu*, *Vasa* and *Majja Dhatu*. All these three have *Snehat wa*as common feature but all the three differ in their site and function.[6] There are two types of *Medo Dhatu*. One is *Poshaka* (Nutrients) and second is *Poshya*(Nourish). Among these, *Poshaka Medo Dhatu* is *Gatiyukta* (mobile in nature) which is circulated in the whole body along with the *Rasa-Rakta Dhatu*, to give nutrition to *Poshya Medo Dhatu*. Through different imaging techniques it can be visualized that lipids along with the cholesterol are being circulated with the blood. Second, *Poshya Medo Dhatu* is *Gativivarjita* (immobile in nature), which is stored in *Medodhara kala*. The site of *Medodhara kala* is *Udara*, *Anuasthi*, *Sphika*, *Stana* and *Gala*.

2.1 Concept of Cholesterol in Ayurveda

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 lipofusin, 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.[7]

2.2 Pathology of Dyslipidemia According to Ayurveda: *Atisnigdha, madhur , adhyashan, atimatra ahara Avyayama, achinta, Diwaswapna Beeja swabhavaj*



Possesses toxic bioproducts of metabolism

Vyanvayu spreads toxic bioproducts in *sarvasharir* with *rasadhatu*

Medovaha srotas vaigunya

Accumulation of abnormal *poshakmedodhatu* in *rasa*

Incomplete assimilation of *sthayimedodhatu*leads to medoroga

2.3Ayurvedic 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.[8]Several individual herbs and combinations of herbs are used in Ayurveda for the management of *Medo Dhatu Vriddhi* (increased lipids), ***aama*** and metabolic disorders.[9]

- ***NidanParivarjana:*** All the nidan (etiological factors) mentioned should be avoided .
- ***Samshodhan* Therapy**

Basti : *Ruksha, Ushna, Tikshna basti* are suggested for *santarpanjanya roga chikitsa*. *Lekhan basti* is considered as the best therapy for *medovriddhi.*

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 LIPID DISORDERS AND *MEDOROGA*:

3.1 Etiological factors

According to Modern	According to Ayurved
Intake of high fat diet	*Medyanna - Atisevana*
Lack of exercise	*Avyayam*
Sedentary life style	*Divaswapna- Achintana*
Genetic predisposition	*Bijaswabhava*

3.2 Clinical Features

According to Modern	According to Ayurved
Excessive deposition of fat in abdomen, waist, buttock etc	*Sphik, udara, parshva, sthanapradeshi Ati medavriddhi*
Excessive appetite	*Ksudaatimatra*
Exertional dyspnea	*Kshudrashwasa*
Excessive perspiration	*Atisweda*
Generalweakness	*Dourbalya*

3.3 Complications

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

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 *Charaka Samhita*, but *Atisthaulya* is mentioned under *Ashtauninditiya*, which is actually *Medoroga.*[10]

In *Madhava Nidan*, the term *Medoroga* is used while describing its etiology. Abnormal accumulation of *Meda Dhatu* 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*[11]] and

Bhavmishra[12] by describing separate chapter of *Medoroga*. *Madhavakara* has described the disease under heading of *Medoroga* in 34th chapter and has used *Medasvina*[13], *Atisthula*[14] and *sthula*[15] 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 Majja Dhatu.* Among the above lipids,vitiated *medo dathu* 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– *Medho dhatwagni mandya* leads to excess homologues *Poshaka MedoDhatu* in circulation, which can be referred to the conditions such as dyslipidemia. Treatment options depend 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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