A Conceptual Study of Medo Dusthi w.s.r. to Dyslipidemia in Ayurveda

Ved Prakash, Deepti Parashar, Sangeeta

1.Ph.D. Scholar, Deptt. of Roga Nidan Evum Vikriti Vigyan, S.K.G.A.C., Kurukshetra (Haryana), India
2.Professor & H.O.D., Deptt. of Roga Nidan Evum Vikriti Vigyan, S.K.G.A.C., Kurukshetra (Haryana), India
3.Ph.D. Scholar, Deptt. of Roga Nidan Evum Vikriti Vigyan, S.K.G.A.C., Kurukshetra (Haryana), India

INTRODUCTION

Meda is mainly present in Udara but Mansa and Brihat Asthi also consist some of it’s part. It is termed as Sarakta Meda when Meda is present inside of Anu Asthi (small bones) and said as Majja when it is present in Sthula Asthi (large bones). Vasa is the pure form of Meda which is present inside the Mansa (Peshi). Thus Meda, Vasa and Majja can be corelated to all forms of lipids.

There are two type of Medo dusthi-
1. Meda Dhatu Vridhi
2. Meda Dhatu Kshaya

In this article, we are describing Medo Dhatu Vridhi in context of dyslipidemia. But among these, Medo Dhatu has importance more importance as it is responsible Medoroga (Hyperlipidemia) and various metabolic disorders. Medoroga is a common term given to the disorder related to Medo Dhatu Dushti. Medodushti is abnormal deposition of Meda Dhatu in body due to disturbances in metabolism and Agnimandya. Unbalanced diet combined with sedentary habits is the most important cause of Medoroga (Sthaulya). Dyslipidemias are a group of disorders that affect lipoprotein metabolism. Dyslipidemia has been
recognized as a separate risk factor for the development of cardiovascular disease (CVD). In both industrialized and developing countries, cardiovascular diseases (CVDs) constitute the leading cause of morbidity and mortality. The medical community is increasingly concerned about the link between dyslipidemia and type 2 diabetes mellitus (DM) as a co-morbidity for cardio-vascular events that finally lead to a high rate of mortality. Dyslipidemia is becoming the leading cause of the most complex and life-threatening disorders, including coronary artery disease, ischemia (which accounts for 56 percent of all I.H.D. cases), cerebrovascular accidents, myocardial infarction (which accounts for 18 percent of all CVD cases), arthritis, and a variety of other conditions such as hypertension, which can lead to multi-organ damage. Increased plasma levels of cholesterol, triglycerides, or both, as well as lower levels of HDL cholesterol, characterize dyslipidemias clinically. The majority of dyslipidemias in industrialized countries are hyperlipidemias, or blood lipid elevations caused by diet and lifestyle. The most prevalent type of dyslipidemia is hyperlipidemia. Hyperlipidemia is believed to be a silent killer because it is difficult for the patient to identify on their own due to the lack of apparent signs. The significance of dyslipidemia may be found in its risk factors, such as diabetes, metabolic syndrome, obesity, and life-threatening consequences, such as cardiovascular disease (CVD). The majority of patients with dyslipidemia have a combination of genetic (often polygenic) and environmental factors contributing to their illness (lifestyle, medical condition or drug).

AIM AND OBJECTIVE
The aims and objectives of present research work are as follows:–

i. To study the Medo Dusthi in context of Dyslipidemia and to review the available literature in Ayurvedic text and its correlation with modern literature.

ii. To evaluate the relation between Medo Dusthi and dyslipidemia.

MATERIAL AND METHODS
It is a review study article.

• In classical Ayurvedic literature, the Medo Dusthi described form of etiology, causative factor, sign & symptom briefly in Brihattrai and Laghutryi.

• In this article review some Ayurvedic text, modern books, PUBMED and Research article.

Conceptual study of Medo Dusthi w.s.r. to Dyslipidemia

Medo Dhatu- Two types of Meda (Fat) are described in Ayurveda 1:-

Baddha (bounded/unmovable) Meda- The fat, which is not mobile and is stored in the form of fat at various places (fat depots/ omentum/muscles in the body).

Abaddha Meda (unbounded/movable) - The fat, which is mobile and circulates in the body along with blood in the form of lipids (Cholesterol, Triglycerides, LDL, HDL & VLDL etc.)

Karma of Medo Dhatu –
As states by Acharya Sushruta, Snehana (oiliness/ luster of skin, hairs and eyes etc.), Sweda (sweat), Dridhatva (strength), Asthipusti (strengthening of bones) and Netra Gatna Snigdhata (oiliness of eyes and body) are the main functions of Medo Dhatu. The term Medoroga was first used by Acharya Madhav to define obesity and related lipid complications. Literally it means a disease in which Medo Dhatu is deranged. In Ayurveda also Meda is considered as prime Dushya in context of different diseases like- Prameha, Medoroga and Sthaulya etc. In the Metabolic Syndrome the abnormal Meda, when deposited into subcutaneous tissue , it gives the clinical presentation of Obesity and similarly when that incompact Meda (Abadha) extracted to Basti (urinary system) it creates the manifestations of Prameha (D.M) and when this Meda is unnaturally deposited in the arterial wall and increase the peripheral resistance (Dhammadpratichaya/arteriosclerosis), it is term to clinical manifestation like Hypertension and when these unnatural Meda present in the Rakta-vaha srotas (CVS) leads to increased level of unwanted fat level-Hypercholesterolemia.

Causes of Medo Dusthi-
The most common cause of Medoroga is an unbalanced diet along with sedentary lifestyle (Sthaulya). The following are the etiological factors of Medoroga:

1. Aharaj Nidan (Dietary Factors): Overeating, frequent eating, excessive Madhur, Sheeta, Guru Ahara, Shleshma dravya Ahara, Ati Med Ahara, Ati Madya (Liquors) sevan, excessive bakery products, and so on are examples of incorrect eating methods.

2. Mansik Nidan (Behavioral Factors): The majority of metabolic disorders are caused by a change in lifestyle. These are caused by habits such as daytime sleeping, lack of exercise, lack of thinking, exhilaration, and sedentary habits.

3. Bijja Doshaj (Genetic or Hereditary Factors): These factors play an important role in the development of Medoroga (Sthaulya).2
4. Mithya Karma (Improper Therapeutic Application): Santarpana (weight gain therapy) may give to Medoroga (Sthula).³ Medoroga is caused by Dushti of Medo Dhatu which involve complex consequential process of Medovriddhi. Acharya Madhav described its pathogenesis as follows-

**Samprapati**-
1. Excessive production of Medo Dhatu (due to dietary factor, behavioral factor, genetic or hereditary factor)
2. Excessive Medo Dhatu lead to margavarodh and depletion of other Dhatus and provocation of Vayu.
3. Provocation of Vayu causes an increase in false appetite, which leads to overeating.
4. Excessive consumption of food lead to excessive Medo Dhatu production.

**Rupa**-
The excessive accumulation of fat and flesh results in ugliness, such as pendulous buttocks, abdomen, and breasts, as well as a reduction in energy, making the person less interested in physical activity. Apart from these basic symptoms, the Charaka Samhita mentions eight Medo Roga impairments, each with a detailed etiology. Ayushohrasa (Diminution of longevity) - Decreased life expectancy due to insufficient feeding of other Dhatus.⁴

- Javoparodha (Lack of enthusiasm) –
- Kricchavyavaya (Difficulty in sexual activity)
- Daurbalya (Debility) –
- Daurgandhya (Foul smell from the body) –
- Swedabadha (Distressful sweating) –
- Kshudhatimatrata (Excessive hunger)
- Pipasatiyoga (Excessive thirst)

**Dyslipidemia**-
Dyslipidemia are disorder of lipoprotein metabolism, including lipoprotein overproduction or deficiency. These disorders may be manifested by elevation of the serum total cholesterol, LDL and triglyceride concentration, and a decrease in the HDL cholesterol concentration.⁵

**Risk Factor**-⁶
Important Modifiable Risk Factor for Dyslipidemia, Serval behaviors can lead to dyslipidemia.

1. Cigarette smoking
2. Obesity and sedentary lifestyle
3. Consumption of foods high in saturated fat and trans fat
4. Excessive alcohol consumption may also contribute to higher triglyceride levels.
5. Genetical cause
6. Advanced age.

**Types of Dyslipidemias**
Dyslipidemia is divided into primary and secondary types.⁷
1. Primary – Inherited or Familial Dyslipidemias
2. Secondary - Acquired

Among the specific types of primary dyslipidemia are-

a) Familial combined dyslipidemia
b) Familial hypercholesterolemia
c) Familial hyperapobetalipoproteinemia

**Symptoms**-
- High blood pressure
- Coronary artery diseases
- Diabetes
- PAD (pulmonary artery disease)
- Obesity
- Abdominal pain
- Acute pancreatitis
- Chronic kidney disease
- Chest pain
- Stoke
- Dizziness
- Calf muscle pain during walking
- Dyspnea
- Confusion.

Table no 1. Shows guidelines of NCEP ATP III :
Dyslipidemia Table no.2 shows Similarity between Meda and lipid

**DISCUSSION**
Excess fat and flesh leads to unsightly features such as pendulous buttocks, abdomen, and breasts, as well as a decrease in energy, making the person less interested in physical activity.¹¹ Medoroga is classified as Atisthaulya by Acharya Charak, who explains that Atisthaulya is caused by the dushti of Medovaha Srotas and can be considered a synonym for Medoroga. Medoroga and its genesis were described by Acharya Madhava. He said that Medodushti is the aberrant deposition of Medo Dhatu in the body. Medodushti is made up of various other Medo Vikaras, together known as Medoroga. Medoroga can be defined as an abnormal and unequal distribution or collection of Medo Dhatu in the body. Madhukoshkara¹² and Bhavamishra¹³ support this notion by describing various chapters of Medoroga. In the 34th chapter, Madhavakar describes the disease under the title of Medoroga, using the words Medaswina¹⁴, Atishtha¹⁵, and Sthula¹⁶ as synonyms. Madhavakar highlighted Nidana and Rupa, and painted a detailed image of Medoroga, incorporating all prior authors' ideas.
CONCLUSIONS

Dyslipidemia is a condition in which the body's lipid levels are aberrant. The vitiated medo dhatu plays a vital part in the development of many metabolic disorders. The etiological reasons, signs, and symptoms of medoroga are essentially identical to those of dyslipidemia. Agni is in charge of the body's metabolic processes. Excess homologues poshak Medo Dhatu circulate due to the disease of medodhatwagni mandya, which can be used to describe a condition like dyslipidemia. The treatment option is determined by the type of lipid problem. The Ayurvedic classics don't have a specific term for dyslipidemia. Scholars have attempted to utilize different names for dyslipidemia, according to the literature. The Ayurvedic notion has been used to treat biomedically defined clinical conditions including dyslipidemia. These hypotheses have been used to better understand the origin and pathogenesis of dyslipidemia, including Medo Dhatu dusthti.

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ORCID
Ved Prakash, https://orcid.org/0000-0001-7250-0758

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Table no 1. According to the guidelines of NCEP ATP III : Dyslipidemia

<table>
<thead>
<tr>
<th>Serum lipoprotein</th>
<th>Fasting values (mg/dl)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cholesterol</td>
<td>&lt;200</td>
<td>Desirable</td>
</tr>
<tr>
<td></td>
<td>200-239</td>
<td>Borderline high</td>
</tr>
<tr>
<td></td>
<td>&gt;240</td>
<td>High</td>
</tr>
<tr>
<td>LDL cholesterol</td>
<td>&lt;100</td>
<td>Optimal</td>
</tr>
<tr>
<td></td>
<td>100-129</td>
<td>Near optimal</td>
</tr>
<tr>
<td></td>
<td>130-159</td>
<td>Borderline high</td>
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<tr>
<td></td>
<td>160-189</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>&gt;190</td>
<td>Very high</td>
</tr>
<tr>
<td>HDL cholesterol</td>
<td>&lt;40</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>&gt;60</td>
<td>High</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>&lt;150</td>
<td>Desirable</td>
</tr>
<tr>
<td></td>
<td>150-199</td>
<td>Borderline high</td>
</tr>
<tr>
<td></td>
<td>200-499</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>&gt;500</td>
<td>Very high</td>
</tr>
</tbody>
</table>

Table no.2 Similarity between Meda and lipid-

<table>
<thead>
<tr>
<th>Meda</th>
<th>Lipid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake of excessive Sneha (Ghrita, Tail, Vasa, Majja)(^8)</td>
<td>Intake of high fatty diet (ghee, oils, butter etc.) increase body lipids</td>
</tr>
<tr>
<td>Dietary intake of excessive Guru</td>
<td>Increase consumption of carbohydrates (specially sucrose enhances cholesterol level)(^9)</td>
</tr>
<tr>
<td>Madhur Ras Dravya causes Medoroga(^9)</td>
<td></td>
</tr>
</tbody>
</table>