

ETIOPATHOLOGICAL STUDY OF *MEDODUSHTI* W.S.R. TO DYSLIPIDEMIA: A COMPREHENSIVE VIEW

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ABSTRACT

Introduction: *Ayurveda* is a science to achieve *hitayu* and *sukhayu*. In *Ayurveda*, diseases are described along with their causative factors and treatment to achieve and maintain a better health condition. With time, many new diseases like dyslipidemia have appeared because of changes in food habits and life style. In *Ayurveda*, dyslipidaemia can be studied as *medodushti*, *medoroga*, *medovaha srotasjanya vikar*, *sthaulya*, *ama meda dhatu*, *rasraktgata snehavridhi* etc. **Objectives:** Since dyslipidemia is not described specifically in *Ayurveda* but is only found as symptomatic description, this article attempts to study the disease according to its symptomatology and pathogenesis (*samprapti*) in *Ayurveda*. **Data Source:** *Charak Samhita*, *Sushruta samhita*, *Ashtanga Hridaya*, Modern medical textbooks, journals and online data bases. **Review Methods:** The classical textbooks and various scientific journals and other databases were reviewed manually. **Results:** *Medodushti* can be correlated with dyslipidaemia and is the precursor of *medoroga* which is a disorder of mainly *agni* and various causative factors like *aaharaj*, *viharaj*, *Mansik*, *beejadosha* are held responsible for the condition. *Medoroga* can be considered as metabolic syndrome as it is group of associated symptoms of impaired fasting glucose, obesity, hypertension and dyslipidaemia. **Conclusion:** The study intends to study dyslipidaemia as *medodushti* which symptomatically is silent in disease nature.

Keywords: *Medodushti*, *sthaulya*, lifestyle disorders, metabolic syndrome

INTRODUCTION: Dyslipidaemia is a disorder of lipid metabolism involving abnormality in any or all the lipoproteins in blood. It is the most important atherosclerotic risk factor. Review of population-based studies in India shows increasing mean total cholesterol levels. Recent studies have reported that high cholesterol is present in 25–30% of urban and 15–20% rural subjects. This prevalence is lower than high-income countries. The most common dyslipidemia in India are borderline high LDL cholesterol, low HDL cholesterol and high triglycerides. Studies have reported that

over a 20-year period total cholesterol, LDL cholesterol and triglyceride levels have increased among urban populations. [1]

According to NCEP ATP II guidelines, Hyperlipidaemia is defined as total cholesterol (TC) > 200 mg/dl and LDL > 100 mg/dl and Hypertriglyceridemia as TG > 150 mg/dl and HDL Cholesterol (HDL-C) < 40 mg/dl. [2] Dyslipidaemia which is mostly associated with increased risk of CAD (coronary artery disease) is hypercholesterolemia that is elevated plasma level of cholesterol carried in LDL. [3] In dyslipidaemia, circulating level

of lipids or lipoprotein fraction are abnormal mainly due to genetic or environmental condition.

When it comes to Ayurveda, we see that there is no such term in *Ayurveda* which can be directly correlated with dyslipidaemia. It can be studied as *medodushti* which symptomatically is silent in disease nature. *Acharya Vijayrakshhit* has described *medodushti* as a precursor of *sthaulya*.^[4] According to *Acharya Charak*, *kapha dosha* aggravates due to continuous intake of its causative factors resulting in increase of *meda dhatu* and *kapha dosha* due to *ashrayashrayee bhava*. This leads to obstruction of *srotas*. As a result, *vata dosha* moves abundantly in *kostha* and hence stimulates the *agni*.^[5] This *agni* digest the food rapidly and *vata dosha* enhances its absorption. So, a person requires more food frequently. If the person does not meet its demand, then these aggravated *vata dosha* and *agni* produces severe complications. Obstruction of *srotas* blocks further *dhatu* nourishment and only *medodhatu* increases in quantity.^[6]

As per *Acharya Sushruta*, two types of pathogenesis can lead to *medo dushti*. First due to excessive intake of its causative factors and *madhur anna rasa* having *atisnigdha* property causing increase in quantity of *medo dhatu*. Second, due to obstruction of *srotas* by increased *medo dhatu* leading to obstruction of further *dhatu* nourishment.^[7] According to *Acharya Vagbhatta*, all causative factors which aggravates mainly *kapha dosha* and contains *medosandharmi ansha* in excess produce *kapha bhuyishtha dosha vridhhi*. This *dosha vridhhi*, due to its *agni vikriti* as a result the *ama*, goes directly to *medodhatu* and mix with *kapha* which causes *vridhhi* of *medo dhatu*. At the same

time, the *srotas* gets obstructed due to *vridhhi* of *medo dhatu* and the *vata* moving in the *kostha* causes increase in *jatharagni* which results in excessive hunger. The person starts intaking excessive amount of food, to pacify his aggravated hunger, and hence results *medoroga*.^[8] Two types of *medoroga* have been described in *Adhamala tika*^[9]

1. *Medoroga: Medovridhhi* including *sthaulya*. As it has also been explained by *Acharya Bhel* that *sthaulya* is considered as a consequence of *medo dhatu dushti*.^[10]

2. *Medodushti*: When *medo dhatu* becomes causative factor for other diseases. Conditions obesity, foul odour from body, excess perspiration, excess thirst, excess sleep and twenty types of *prameha* are all complications of *meda dhatu dushti*.^[11]

MATERIAL AND METHODS

The *Bruhatrayi* were studied thoroughly to clear the concept of *meda*, *medoroga* and *medodushti*. Dyslipidaemia was studied from the modern medical books. Various journals were also reviewed for the selected topic. At last, supportive correlation was tried to establish between *medodushti* and dyslipidaemia for a valid approach.

LITERATURE REVIEW:

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.^[12]

Prevalance of dyslipidemia:^[13]

- The prevalence of dyslipidemia is observed to be higher in males than in females.

- Total Cholesterol concentration \geq 200mg/dl is found to be 38.7% and 23.3% in males and are females respectively.
- HDL-C is abnormally low i.e. 64.2% and 33.8% in males and females respectively.
- Hypercholesterolemia and Hypertriglyceridemia is more prominent in 31 - 40 age group.^[14]

Causes ^[14]

Primary causes:

Primary causes are single or multiple genetic mutations that result in either overproduction or defective clearance of TG and LDL cholesterol or 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 years), a family history of atherosclerotic disease, or serum cholesterol > 240 mg/ dl.

Secondary causes:

The most important secondary cause of dyslipidemia in developed countries is 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 drugs such as thiazides, β -blockers, retinoids, highly active antiretroviral agents, cyclosporine, tacrolimus, estrogen & progestins and glucocorticoids. Secondary causes of low levels of HDL cholesterol include cigarette smoking, anabolic steroids, HIV infection and nephritic syndrome.

Sign and Symptoms:

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 arcus corneae and tendinous xanthomas at the achilles, elbow & 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 (lipemia retinalis).
- Extremely high lipid levels also give a lactescent (milky) appearance to blood plasma. Symptoms can include paresthesias, dyspnea and confusion. 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 then the metabolites produced will not get assimilated by the body properly. The resultant product of such metabolic action is called as *ama*. *Ama* is considered to be the primary cause of all metabolic disorders in *Ayurveda*. The accumulation of *ama* can be compared with the accumulation of lipofuscin, 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.

Dyslipidemia is a form of *kaphaja vikara* specifically by *Medodushti* in the form of *abaddha meda*. *Abaddha meda* as described by *Acharya Chakrapani* – ‘*Abbadhamitiasahatam*’^[16] means the *poshaka* or *asthayi medodhatu* which is mobile in nature and circulates in whole body with *rasa-rakta dhatu*.

Concept of Meda in Ayurveda:

In our body, there are various types of *dhatu* and *updhatu* that have *sneha* in nature like *meda dhatu*, *majja dhatu* and *vasa updhatu*. These *dhatu*s and *updhatu*s can be considered as lipid. *Meda* is present mainly in *udara* but if is present inside small *asthi*, it is called as *sarakta medas* and when in *sthoala asthi*, the same is called as *majja*.

Moola of Medovaha Srotas:

Each and every *srotas* have their two endings, one from which it is originated i.e. *moola*, another is the one through which nutritional material transport to its respective place in the body. Our *acharyas* have considered *vrikka* as one of the *moola* of *medovaha srotas* whereas *vapavahana*, *kati* and *mansa* are mentioned as second *moola* separately.

Charak- *Vrikka* and *Vapavahana*

Sushruta- *Vrikka* and *Kati*

Vagbhat- *Vrikka* and *Mansa*

Following two types of *Meda dhatu* are described in *Ayurveda*^[17]: -

- **Baddha Meda-** *Medo dhatu* which is immobile and is stored in the form of fat at various sites of the body. This is also called as *sthayimeda dhatu* and is stored in *Medodhara Kala*. *Udara*, *stana*, *anu asthi*, *spatika* are the sites of *medodhara kala*.^[18]

- **Abaddha Meda** – *Medo dhatu* which is mobile in nature and circulate in *medovaha srotasa*. It is *posyameda dhatu*

which circulate in the body along with *rasa* and *rakta dhatu* and give nutrition to the *sthayi meda dhatu*. *Abaddha medovridhi* represents the fat which moves freely in the form of plasma lipid with blood circulation. On clinical perspective, it can be understood as the *badha meda vridhi* leads to adiposity (obesity) whereas *abaddha meda vridhi* leads to dyslipidemia.

Functions of Meda Dhatu:^[19]

1. **Snehana (Lubrication):** *Snehana* is the main function of *meda dhatu* which is responsible for the lustre of skin, hair, eye etc. It also provides lubrication to the internal organ of the body. Increased *snehana* is the reason of *snigdha gatrata* in *sthaulya*.

2. **Swedotpatti (Sweating):** *Sweda* is *mala* of *meda dhatu*. *Swedotpatti* increases whenever *meda dhatu* exceeds its normal quantity. *Meda dhatu* is also responsible in regulation of body temperature as it works as an insulator.

3. **Drudhta (Stability to body):** *Meda dhatu* provides stability and strength to the body.

4. **Asthiposhan (Nourishment to Bones):** The own heat of *mansa dhatu* along with *prithvi*, *tejas*, *vayu* gives rise to hardness and thus the bone tissue is produced and nourished from *meda dhatu*.

Meda Dhatu Vridhi^[20]

As we can see that the persons with dyslipidaemia are either obese or are more prone to become obese. Same has been explained in *Ayurveda*. As per *Acharya Bhel*, *Sthaulya* has been considered as a consequence of *medo dhatu dushti*.^[21] Increase in *meda dhatu* results in following symptoms:

- *Snigdhangata* (smoothness of body parts)

- *Udar parshwa vridhi* (Peripherals well as abdominal distension)
- *Kasa* (Cough)
- *Shwasa* (Breathlessness)
- *Daugandhya* (Foul smell)
- *Shrama* (Fatigue)
- *Sphik-stana-udarlambanam* (Fat deposition on breast, waist, buttock and abdomen in excess)

Flow chart 1.Samprapti of Medodushti:

Nidana

(Aaharj,viharaj ➡️ Kapha prakopa ➡️ Agni mandhya ➡️ Ama utpatti ➡️ Kapha&Meda dhatu vridhi and beejdoshaj)

(due to *ashrayashrayee bhava*)

Obstruction of *strotas*

Nourishment of only *meda dhatu* & Improper nourishment of other *dhatu*s

Disturbance in *vata* movement

Vayu goes in *koshtha* which in turn increases appetite

Medoroga (after a long duration)



Medodushti

←️ *Ati medotpatti* (production of extra fats)

←️ Fast digestion & assimilation with excessive eating

Samprapti Ghatak:

Dosha: Kapha & Vata

Dushya: Rasa & Meda dhatu

Agni: Jatharagni & Rasa and Meda dhatvagni

Srotas: Rasavaha & Medovaha

Srotodushti: Sanga

Adhishthana: Sampurna sharir

Udbhava sthana: Amashaya

Rogamarga: Bahya

Correlation between Medodushti and Dyslipidemia in the following perspectives: -

Table No. 1: Etiological factor

S.No.	Medodushti	Dyslipidemia
1.	<i>Avyayama</i>	Lack of workout
2.	<i>MedyannaatisevnaandPayasaVikarsevana</i>	Intake of high fatty diet
3.	<i>Divaswapna</i>	Sedentary life habit
4.	<i>Beejdosa</i>	Genetic predisposition
5.	<i>Avyavaya</i>	Lack of sexual life
6.	<i>Harshnitya</i>	Uninterrupted cheerfulness

7.	<i>Achintana</i>	Lack of anxiety
8.	<i>Manasonivritti, achintana</i>	Without mental tension
9.	<i>Varuniatisevan</i>	Alcohol consumption
10.	<i>Avyayama</i>	Lack of workout

Table No. 2: Clinical features

S.No.	<i>Medodushti</i>	Dyslipidemia
1.	<i>Sphik, udara, parshvasthana pradeshe ati meda vriddhi</i>	Fat deposition on breast, waist, buttock and abdomen in excess
2.	<i>Kshudaatimatra</i>	Excessive appetite
3.	<i>Kshudrashwasa</i>	Breathlessness and exertion
4.	<i>Swedadhikya</i>	Excessive perspiration
5.	<i>Daurbalya</i>	Weakness/debility
6.	<i>Pipasadhikya</i>	Excessive thirst
7.	<i>Atinidra</i>	Excessive sleep and snoring
8.	<i>Daurgandhya</i>	Excessive body odour

Table No. 3: Complications

S.No.	<i>Medodushti</i>	Dyslipidemia
1.	<i>Ayushohrasha</i>	Decreased life expectancy
2.	<i>Javaprodha</i>	Mechanical disabilities
3.	<i>Alpaprana</i>	Loss of immunity
4.	<i>Vatavikara</i>	Cardiovascular and cerebrovascular manifestation

DISCUSSION: When we go through Ayurveda, we find that there is no any parallel term for dyslipidemia. Thus, there is no disease and disease condition that can be correlated directly with dyslipidemia in Ayurvedic text but the concept of *abaddha meda* have similarity with the concept of lipid. The lipids are mobile in nature like *abaddhameda*. So, *meda dhatu dushti* can be correlated with dyslipidemia specially with *abaddhameda dhatu*.

Meda dhatu is a type of *sneha* with *ambu* & *prithvi* predominancy. [21] *meda dhatu* has dominancy of *prithvi*, *jal* and *tej mahabhuta*. [23] The total quantity of *meda* is two *anjali* and *vasa* (muscle's fat) is

three *anjali*. [24] Thus, total *meda* content of body is enumerated as 5 *anjali* and total measurable body elements are counted as 56.5 *anjali* from this proportion. Modern physiology has also mentioned the same amount of fat. It is evident that total fat content of body is 11 to 12% approximately. This quantity may differ from person to person and exact measurement of body humoral is not possible due to unpredictable and ever-changing nature of body. [25] *Kapha* and *medo dhatu* causes obstruction of *strotas*, leading to improper nourishment of other *dhatu*. Resultantly, elevated *vata* goes in

koshtha and increases appetite of the person. Thus, leading to *Medodushti*.

On treatment part, *nidana parivarjana* (avoidance of causative factors) has been considered as the first and foremost treatment of all diseases. Hence, all the etiological factors mentioned for the disease should be avoided. In Ayurveda, *lekhan* drugs can be understood as hypolipidemic drugs/lipid regulating drugs and hence can be given in hyperlipidaemia. *Kapha dosha* and *meda dhatu* are the main factors vitiated in the pathogenesis of *meda dhatu dushti*, so the measures should be adopted to reduce these two factors. As *medoroga* is stated as a *santarpanjanya vyadhi* hence *aptarpana chikitsa* should be employed as its *samanya chikitsa*. *Raktamokshana*, *vyayama*, *upavasa*, *dhuma*, *swedana*, *rukshanna sevana*, different types of *churnas* and *pradehas* comes under *apatarpan chikitsa*. *Acharya Sushruta* has suggested common treatment for *Kustha*, *Prameha*, *Sthaulya* and *Shotha*. He has mentioned nine drugs which are effective in the *dushti* of *medadhatu* in *Kushtha Roga Chikitsa* which can serve as a guideline for the treatment of hyperlipidaemia.

Research suggests that regular aerobic exercise can help increase HDL levels. Even moderate exercise reduces the risk of heart attack and stroke. It is has also been recently proven that people with an active lifestyle have a 45% lower risk of developing heart disease than sedentary people.

CONCLUSION: *Medodushti* occurs when *meda dhatvagni* is weak and fail to nourish the next *dhatu* in sequence. This process results to *abaddha medodhatu vridhhi* and this stage of pathogenesis can be correlated with dyslipidemia on the

basis of same etiological factor, disease process and clinical features. As time passes by continuing with etiological factors, this *medodushti* turns into *medoroga*.

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