

A Critical Review on *Medo-Roga* in Context of Metabolic Syndrome

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Abstract: *The present study conceptually tries to correlate Metabolic Syndrome as per Ayurvedic parlance. The disease Metabolic Syndrome is the combination of three among the four common - Obesity, Diabetes, Hypertension, and Dyslipidemia. On the basis of observation it seems that some defect in the metabolism as well as utilization of lipids gives priority to Obesity and Dyslipidemia in Metabolic Syndrome. In context of Medoroga, 'Madhukosha' mentions sneha as the factor from which meda is formed. All the Dhatu nourish mainly by Sneha. So the excess intake of fats leads to excess deposition of lipid in the body. The disease Medoroga (obesity) is mainly due to imbalance of energy; intake is greater than output.*

Keywords: Obesity, Dyslipidemia, *Sneha*, *medoroga*, Energy imbalance

1. Introduction

Metabolic syndrome has received increased attention more & more in the past few years globally and the burning problem of today's world. The most important factors for development of syndrome includes aging, genetic predisposition and lifestyle i.e. low physical activity and excess calorie intake. A recent study suggested that daily intake of milk and equivalent dairy product has increased the risk of metabolic syndrome. Disturbance in glucose and insulin metabolism, over weight and abdominal fat distribution, mild Dyslipidemia and hypertension and its association with subsequent development of type-2 diabetes mellitus and cardiovascular disorders has given the origin of concept and development of metabolic syndrome, also known as insulin resistance syndrome. Metabolic syndrome is a heterogeneous group of disorders manifesting as obesity, hypertension, dyslipidemia and hyperglycemia. Insulin resistance is one of the key components of metabolic syndrome. Metabolic syndrome is a combination of medical disorders that increases the risk of developing diabetes and cardiovascular diseases. It affects a large number of people and prevalence increases with age.¹

The metabolic syndrome represents a combined occurrence of atherogenic dyslipidemia, insulin resistance, hypertension and obesity. It is established that obesity and metabolic syndrome significantly influence the onset of cardiovascular disorders particularly in presence of type-2 diabetes mellitus. The etiopathogenesis of metabolic syndrome is both genetic as well as environmental factors. It is reported that about one quarter of adults and nine percent of teenagers are having metabolic syndrome.²

The need to do a comprehensive review of this particular syndrome has arisen in view of the ever increasing incidence of this entity.

Metabolic Syndrome is mainly due to abnormal metabolism of *Meda*, though from the beginning of the digestive process *Meda* may be formed from *Ahara Rasa* specially which having

the profuse quantity of *Sneha*. That is rightly said by *Acharya Kanthadatta* in his '*Madhukosha*' commentary – '*Snehat medo janayati*'.³

By *Jatharagni Paka* following changes occurs in *Sneha*:

I step: *Guru* into *Laghu* & *Sthula* into *Sukshama* i.e. long chain TG into Short chain TG

II step: *Sara Bhaga* formed at the end of digestion by *Jatharagni* undergoes *Bhutagni Paka*, where the *Laghu Guna* is again converted into *guru* i.e. Re-esterification of TG, which occurs in the mucosa of small intestine.

III step: *Sneha* is subjected to *Dhatvagni Paka*. According to *Kedarikulya Nyaya*, *Sneha* goes to all the *Dhatu* and undergoes digestion by their respective *Dhatvagnis* as per the need, uptake and utilization. For e.g. digestion of *Madhura Rasayukta Sneha* occurs by *Medo-Dhatvagni*, by passing the digestion by *Rasadi Agni*'s. Even *Vrishya* (aphrodisiac) *Drugs* also directly undergo *Paka* by *Shukra Dhatvagni* by its virtue. *Mala Bhaga* of *Sneha* also undergoes digestion by their respective *Malagnis* and does the nutrition of *Mala*.

2. Concept of Meda-

Two types of *Meda* (Fat) are described in *Ayurveda*⁴:-

- *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.)

Sthana and Swarupa of Medo Dhatu:

There are 2 types of *Medo Dhatu*. One is *Poshaka* (nourishing) and second is *Poshya* (which get nourishment).

Among these two, *Poshaka Medo Dhatu* is 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.⁵ Second, *Poshya Medo Dhatu* is having immobile nature, which is stored in *Medodharakala*. The site of *Medodharakala* is *Udara* (abdomen) and *Anuasthi* (bones). *Udara*, *Sphika* (buttocks), *Stana* (breast tissue) are also depots of *Poshya Meda*.⁶ *Medo Dhatu* is also considered as a *Sneha* dominant *Drava Dhatu* which is having *Guru* (heavy), *Snigdha* (oiliness) properties and dominance of *Prithvi* (earth), *Apa* (water) and *Teja* (fire) *Mahabhoota*. As a result of *Mamsagnipaka*, it can be distinguished in the form of *Sukshmabhaga* (minute or nano portion), which is responsible for the further transformation of the *Medo Dhatu*.

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-Gatra Snigdhatva* (oiliness of eyes and body) are the main functions of *Medo Dhatu*.⁷

Comparison between the concept of Meda and lipids:

Ingestion of excessive *Sneha* (*Ghrita*, *Taila*, *Vasa* & *Majja*) cause *Medoroga*⁹ while intake of high fat diet (ghee, oils, marrow, butter, etc.) increases body lipids. Dietary intake of excessive *Madhura Dravyas* (sweet foods) causes *Medoroga* while increased consumption of carbohydrates (especially sucrose) enhances cholesterol level. Fat gives an oily appearance to the body (*Medo-Snigdhangata*). *Meda* is the main factor (*Dushya*) which is affected in *Sthaulya* and *Prameha* while Obesity and diabetes are often associated with abnormal lipid levels.

Formation of Medo Dhatu from Raktadi Dhatus:

The formation of *Medo Dhatu* is from *Mamsa Dhatu* when acted upon by *Meda Dhatvagni* on *Medaposhakamansha*. If any disturbances found in these above pathways during formation of *Medo Dhatu*, it may lead to *Medo Vriddhi* or *Medo Kshaya* causing *Sthaulya* (obese) or *Karshya* (emaciated) respectively. *Medo roga* and *Sthaulya* is same thing as clear from the fact that in *Madhav Nidana* the term “*Medo Roga*” is used for the first time for *Sthaulya* and *Atisthauhya*.

Sthaulya, Medoroga & Metabolic Syndrome-

Sthaulya, *Medoroga* and *Medodosha* have been described to be synonymous to each other. 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. It is only one type of disease according to *Ayurvedic* texts, but *Adhamalla* has tried to distinguish between two types of *Medoroga*; 1) Adiposity (*Obesity*), including its clinical features (*Sthaulya*) & 2) Lipid Disorders where *Meda* acts as an etiological factor in the genesis of other Diseases (secondary).

The word *Sthaulya* is derived from the word ‘*Sthula*’ which means to grow or increase in size. In context of *Sthaulya* it refers to excessive growth of adipose tissue in body.

Acharya Charak has described *Sthaulya* as excessive increase in quantity of *Meda* and *Mamsa Dhatu* (muscular tissue) leading to pendulous movements of buttock, abdomen and chest with morphological disproportion. Such a person suffers from lack of energy.⁹

In *Ayurveda* also *Meda* is consider 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*¹⁰ (D.M.) and when this *Meda* is unnaturally deposited in the arterial wall and increase the peripheral resistance (*Dhamnipraticchaya*/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.

The formation to *Meda* not only depends on the over consuming but also due to less utilization. The modern life style makes the human beings more comfortable. The basics concept for utilization of excess energy should be done through physical exercise but in this era we are prefer to the mental exercise than that of physical exercise. That is why it is rightly said by *Sushruta*- walking without rest at hundred *Yojana*, one of the best remedies for *Sthaul prameha*. It is also mention in *Raguvansham* of *Kalidasha*, the king *Dileep* probably suffered from type-2 Diabetes and ultimately become impotent due affect of its complication and as a remedy that walked with *Nandinee*, the daughter of *Kamdhenu* cow, to obey the recommendation of sage *Vashistha*. So it is clear that proper exercise as well as low calorie diet may be one of the potent remedy for the particular state.

Vagabhatta is the first to describe the types of *Sthula Purusha* and has categorized them into (i) *Heena Sthula*, (ii) *Madhya Sthula* and (iii) *Atisthula*. He has considered *Madhur Rasa* overconsumption leading to *Sthaulya* and has recommended *Langhan* therapy for *Sthula* person in *Dwividha Upkramaniya Adhyaya*. He has stated that *Medovriddhi* induces *Sthaulya*, *Purvarupa* of *Prameha* and complication related with various diseases of *Sleshma*, *Rakta* and *Mamsa*.

Obesity is the main cluster among the disease series of the Metabolic Syndrome. There are different causative factors for the formation of this disease. The etiology which is mentioned in the classics may be sub categorized as dietetic, regimental, genetic and mental phenomena.¹¹ But it is surprising that in the clinical practices we observe some overweight patients even after avoidance of the previous *Nidana* (causative factors). In the *Ayurvedic* concept there are different steps which incorporate that particular disease, and it basically starts from digestion and absorption.

Medovaha Srotasa

In nutshell, metabolic syndrome is due to defect of the metabolic pathway. In *Ayurveda*, the *Medodhatu* is transported *Medovaha srotas*¹², macro and micro channels. The root of the *Medovaha srotas* is *Vrikka* (kidney) &

Vapavahana (omentum & adipose tissue) according to Charaka, as per Sushruta, Vrikka & Kati (lumbo-sacral region) and as per Vagbhatta Vrikka & Mamsa. This variation is due to their different viewpoints. The word of Moola means root, it may be root of the origin, root of manifestation and root of nutrition etc. In case of Medoroga, especially central obesity the adipose tissue are deposited into theca abdomen specially omentum & subcutaneous region which is clearly mentioned by Chakrapani with the upma- Tailvarti. So the root here denotes the site of usual manifestation. On the other hand, the upper part of the kidney supra-renal gland, which control the secretion of epinephrine & non-epinephrine hormones actively participate in the break down process of the Triglycerides.

Pathogenesis of Medoroga in context of Metabolic Syndrome

In context to medoroga the Dalhana in his commentary mentioned that the formation of meda may occur directly by Aahara rasa. The formation of Meda is slimy and sticky in nature and may obstruct the micro channels and in gradual manner through Margavarodha. It increases Vata dosha. This process is very gradual, sustained release of Vayu in required quantity gives nutrition in this biological burning process and as clinical manifestation appetite increases, which ultimately lead the patient to crave for more diet.¹³

The basic pathology for Obesity is disproportion of intake and output of energy; it is easily manageable by the patient by following the instruction of the physician. Food is the main source of energy. In the pathogenesis of Medoroga due to increased appetite patient cannot tolerate hunger, ultimately consumes more energy and the pathological process continuous as a vicious cycle.

The Mansik Nidana of Sthaulya Harshanitytvat and Achintnat (never anxious) the two similar factors in context of consumption of energy. Nityaharsha (daily amusement) nourishes Indriya (sensory organs), Indriyatha, Mana and Buddhi (mind & soul) respectively. On the other hand, less utilization of energy due to factor like Achintana may accelerate the pathological process.¹⁴

3. Discussion

As per Ayurvedic concept, the etiological route of the Medoroga is a vicious cycle, Meda which obstructs the micro channels leads to vitiation of vayu (due to Margavarodha) and that increased vata dampens the Jatharagni like a strong gust as wind instead of assisting fire blows it out. So release of the vayu should be in sustained manner and augmented Agni then enhance the appetite, as a result patient takes more diet and cycle keeps on going. Thus it is clear that the disease Medoroga not only depends on energy imbalance but there must be other key factors (Nidana-root cause) which are responsible for these phenomena. Everyone not get obese after habitual heavy meal and every obese person not able to lose weight after habitual less diet. So the key factors may be Beeja swabhava (hereditary) which actually controls every metabolic process. The etiology of the Medoroga it may be classified

in to clusters of Aharatmaka (eating habits), Viharatmaka (regimen), Manasika, Beeja swabhava.

Ayurveda believes that energy which is acquired from the diet may be physical and mental in nature. The mental phenomena like Atiharsha also supply energy to the Indriya and Manasa. On the other hand the factor Achinta which cuts down on expenditure of energy. So in nutshell, to prevent the disease Medoroga it is very much essential to balance the energy. It may be performed through dietary control and exercise.

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