

Review Article

Study of the role of Agni in Medovruddhi with special reference to metabolic disorder - Hyperlipidaemia

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ABSTRACT:

Medavruddhi (Excessive body fat) and its metabolic consequence are worldwide epidemics. Principal among metabolic comorbidities associated with excessive body fat is hyperlipidaemia, which is one of the commonest presentation and major cause for various lifestyle disorders.

Agni is the digestive and metabolic fire of the body. Improper functioning of Agni leads to various gastrointestinal disorders as well as various metabolic disturbances. *medo dhatwagni mandhya* leads to excess homologues *poshaka medo dhatu* in circulation, which can be referred to the conditions such as *medovruddhi*. When *Medo Dhatwagni* is impaired and the homologues nutrients present in *Poshaka Meda Dhatu* will be in excess in circulation and this can be referred to the conditions such as hyperlipidaemia. This is because the *Poshaka Meda Dhatu* cannot be assimilated into *Sthayee Meda Dhatu* by *Medo Dhatwagni*. Therefore, main principle of treatment of *medovruddhi* as per *Ayurveda* is to restore and to strengthen the *Agni*.

KEY WORDS: *Medovruddhi*, *Agni*, *Medodhatwagni mandhya*, Hyperlipidaemia, Metabolism, Lifestyle disorders.

INTRODUCTION:

Medovruddhi is a metabolic disease, which is encountered in routine clinical practice nowadays. Abnormal accumulation of *Meda Dhatu* in body is defined as '*Medovruddhi*'. The situation behind it is *Medodhatwagnimandya* and *medavaha strotodusti*.

Hyperlipidemia is a family of disorders that are characterized by abnormally high levels of lipid (fats) in the blood. The term fat may refer to lipids as well as the cells and tissue that store lipid i.e. adiposities. While fats play a vital role in the body's metabolic processes, high blood levels of fats increase the risk of coronary heart disease (CHD). According to WHO study in Global health observatory (GHO) data it is mentioned that Globally, a third of ischaemic heart disease is attributable to high cholesterol. Overall, raised cholesterol is estimated to cause 2.6 million deaths (4.5% of total) and 29.7 million disability adjusted life years (DALYS), or 2.0% of total DALYS. Raised total cholesterol is a major cause of disease burden in both the developed and developing world as

a risk factor for Ischemic heart disease and stroke. A 10% reduction in serum cholesterol in men aged 40 has been reported to result in a 50% reduction in heart disease within 5 years; the same serum cholesterol reduction for men aged 70 years can result in an average 20% reduction in heart disease occurrence in the next 5 years.⁽¹⁾

In this article, we study the relationship among *Medovruddhi* and Hyperlipidaemia and the role of agni in Aetiopathogenesis of *Medovruddhi* and how Hyperlipidaemia or *medavruddhi* can be treated by restoring and strengthening the agni at different level.

Aims and objectives:

- 1) To review the literature related to *Agni*, *Medodhatu*, *Medovruddhi* and Hyperlipidaemia.
- 2) To establish the relationship in between *Medovruddhi* and Hyperlipidaemia.
- 3) To study the role of *agni* in Aetiopathogenesis of *Medovruddhi*.

MATERIALS AND METHODS:

This is a literature review article where all available *ayurvedic* classics, modern available text, magazines, journals, Post graduate dissertations and research papers were reviewed and emphasized.

Concept of Agni:

The concept of *Agni* is critically important to our overall health. *Agni* is the force of intelligence within each cell, each tissue, and every system within the body. Ultimately, it is the discernment of *Agni* that determines which substances enter our cell and tissue, which substance should be removed as waste. In this way, *Agni* is the guard of life. It is a factor which is capable of penetrating into minute spaces or which brings changes in a substance. It comprehends various factors which participate and regulate the course of digestion and metabolism or any transformation in the tissue of an organism. The term metabolism (literally means 'change') is used to refer to all the chemical and energy transformations that occur in the body, which is nothing but the function of *Agni* (2).

Location of Agni:

Pittadhara kala situated between *amashaya* and *pakvashaya* is considered as the location of *Agni* (3). This location is also known as *Grahani* which is supported and nourished by *Agni*, so it gets vitiated when there is low strength of *Agni*(4)

Digestive abilities being related to the strength of *Agni*. *Agni* converts food in the form of energy, which is responsible for all the vital functions of our body. *Agni* is key factor in transformation of consumed *Ahara Dravyas* of *Vijatiya* (heterogeneous) nature to *Sajatiya* (homogenous) nature. *Agni* is derivative of *Tejas* (fire) *Mahabhuta*, it carries metabolic transformation in which the inherent features is changed. A balanced *Agni* therefore is vital for health (5).

In *Ayurveda*, there are thirteen types of *Agni* which can be basically classified into three categories:

1. *Jatharagni* - one
2. *Bhutagni* - five
3. *Dhatwagni* - seven

1. *Jatharagni*: Is also named as *Kayagni*, *Kosthagni*, or *Pachakagni*. It is the *Agni* located in gastrointestinal tract and makes the digestion of food taken followed by absorption of *saarabhaga* (nutrients) through intestinal villi and mucosa to enter into lymph or

blood, and elimination of *kitta bhaga* (*mutra, purisha*) in the process. It comprehends various digestive chemicals and enzymes produced in or poured in the gastrointestinal tract which participate in the course of digestion and absorption (6). Unless the *saarabhaga* produced by *jatharagni* is qualitative, it will not be suitable for further process of *Bhutagni* and *Dhatvagni paka* whereby their function get disturbed. Hence *Jatharagni* is important for better functioning of other *Agni* in the body (7).

According to its performance of digestion as per influence of *Tridosha*, four functional states of *Agni* have been envisaged (8). Due to pre-eminence of *kapha*, when *Agni* is unable to digest even a small quantity of easily digestible food can be called as *Mandagni*. When *Agni* is dominated by *pitta dosha* it is *Tikshnagni*. Here, even a very heavy diet is digested in a short span of time again leading to hunger. When action of *Agni* is irregular and unpredictable due to predominance of *vata dosha*, it is referred as *Vishmagni*. State of *Agni* due to balance of three *dosha* can be taken as *Samagni*. It represents normal functional state of *Agni*. Only *Samagni* is the physiological state (*samasthiti*) while remaining three are the abnormal states of *Agni* leading to various disorders.

2. *Bhutagni*: According to *Charak* there are five types of *Bhutagni* representing each *mahabhuta*, which digests their respective components like *Parthivagni*, *Tejasagni*, *vayavagni* etc (9).

Bhutagni, with the help of *Jatharagni* makes exogenous food components (*ahara panchamahabhuta*) to endogenous (*shareer sthit panchamahabhuta*) form for assimilation. According to *Aacharya Sushruta*, the food which consists of five *Mahabhutas* is digested in its turn by the *Bhutagnis* and each of its principles proceeds to supplement its own analogue in the human organism. *Bhutagni* function starts after absorption i.e. portal circulation to liver and before assimilation by delivering *asthaya dhatvamsha* (precursors of *dhatu*) into circulation through hepatic vein. Hence *Yakrit* (liver) is considered as centre of *Bhutagni* functions.

3. *Dhatvagni*: *Agni*, by means of which *ahararasa* (nutrient molecules of food) undergoes further transformation till it takes status of particular *dhatu* is termed as *Dhatvagni*. These *Agni* are controlled and regulated by *Jatharagni* (10). They are seven in number handling mechanism of seven *dhatu*. These *Agni* once again digests food products into two proportions one portion is '*Sara*', of which *Sthulansa* nourishes the

concerned *dhatu*, *upadhatu* and *Sukṣmansa* provides nutrients for the next *dhatu*. The other portion is called 'Kitta' that nourishes the 'Mala' or waste portion of that *dhatu* ⁽¹¹⁾.

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 *medo dhatu*, *vasa* and *majja dhatu*. All these three have *snehatwa* as the common feature but all the three differ in their site and function.

Medas is present mainly in *udara*, but some of it is also present in *mamsa* and *asthi*. The *medas* present inside small (*anu*) *asthi* is called *sarakta medas* and when it is present in large (*sthula*) *asthi*, the same is called *majja*. The pure form of *medas* present in *mamsa* (*peshi*) is called *vasa* ⁽¹²⁾. Thus all forms of lipids in the body are present mainly in *meda*, *vasa* and *majja*. But importance is given to *medo dhatu* which is having significant role in developing many metabolic disorders like *medoroga*, *prameha*, etc.

Meda dhatu:

Meda dhatu is the fourth *dhatu* amongst seven. It is formed by *pancha mahaboota* and has predominance of *jala* and *pruthavi mahabhoota*.

Utapatti of meda dhatu

It gets generated in intra- uterine life. Growth and nourishment is by food just like any other *Dhatu*. When *Mamsadhatu* takes its origin in *Mamsavaha srotas*, *Mamsa dhatwagni* acts on its nutriments coming from *Ahara rasa* and from *Raktavaha srotas*. *Mamsadhatu* is produced in *Mamsavahasrotas*. Part of *Mamsa dhatu* reaches next *srotas* are acted upon, by *Medodhatwagni* and give rise to *Medadhatu* proper. From this *Meda dhatu* its *Upadhatu* is generated. *Mala* of *Meda dhatu* gets also produced. The *sthoala ansh* forms *meda dhatu* and the *sookshma* part goes forward for formation of *asthi*.

There are two types of *medo dhatu*. One is *poshaka* and second is *poshya* ⁽¹³⁾. Among these two, *poshaka medo dhatu* is mobile in nature (*gatiyukta*), 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 cholesterol are being circulated with the blood. Second, *poshya medo dhatu* is having immobile nature (*gativivarjita*), which is stored in *medodharakala*.

Derangement of Metabolism (Parinama) of Medas:

Role of Agni in Parinaman of Dhatu:

Agni is responsible for all metabolic activities of the body. It is solely responsible for any increase or decrease of *Dosha*, *Dhatu* or *Mala*. The vitiation of *Agni* has serious impact on health at various levels depending on type of *Agni* involved. If *Agnimandya* is present at the level of *Jatharagni* only, then *Ama* is usually restricted to *koshtha*. There will be no production or *Aahara Rasa* and the result will be obviously *Dhatu Kshaya*.

If *Agnimandya* is present at the level of *Bhutagni*, then *Ama* is restricted to *Aahara Rasa* (*Aahara panchmahabhuta* cannot be converted into *sharira upyogi panchmahabhuta*) and this *Aahara Rasa* which is improperly formed cannot be assimilated by *Dhatu* and results in *Dhatukshaya*. It should be noted that *Ama* will be in circulation. This *Ama* can be accumulated in any parts of the body leading to various disorders. Also, it is important to note that which among the 5 types of *Bhutagni* is involved. If one *Bhutagni* is involved, it leads to impairment in nourishment of that particular *Dhatu* which is having predominance of that particular *Mahabhuta*.

If *Agnimandya* is present at the level of *Dhatwagni* (one or more), then the particular *Dhatu* cannot assimilate nutrients present in the circulating *Aahara Rasa* or circulating *Poshaka Dhatu*. So, such *Poshaka Dhatu* will be accumulated in *Aahara Rasa* in abnormal quantities and they may further get accumulated at abnormal sites. This sort of process can be called *Leenatwa* (deep seated) of *Ama* in *Dhatu*. Such *Leenatwa* can cause a number of disorders. But it should always be kept in mind that once *Jatharagni* is impaired, the *Bhutagni* and *Dhatwagni* would also be having impairment. Hence during treatment of any kind of *Agnimandya* or *Ama* conditions, one should think about all the three levels.

Concept of Meda vrudhhi

Abnormal accumulation of *Meda Dhatu* in body is defined as '*Medovrudhhi*'. The situation behind it is '*Medovaha Strotodushti*'. *Medovrudhhi* is a complex process which occurs due to *Medodhatwagnimandya*.

Samprapti of medovrudhhi

As per all dietic, lifestyle and emotional disturbances considered as etiological factors for '*Medovrudhhi*' first reflect on *Jatharagni* (i.e. digestive power) and manifest symptoms like *Agnimandya* that is alteration in *Agni* or digestive power. As a result *ama*

(improperly processed essence) is formed. Which get mixed with *kapha* residing in the *dhatu*s makes them weak. If person continues with same habits and diet even after the manifestation of '*Agnimandya*' and *Aamadusti* positively result in *strotorodh*. And because of *Strotorodha* by increased *Meda* (i.e. *Medovruddhi*), *Vata* shifts itself to *Amashaya*, whips up the *Jatharagni* hence assimilates in the food. Thus, increases the digestive activity leads to increasing capacity of large quantity of food, and because of *strotorodh* which hinders it for going to the other *dhatu*s. As a result there is increase in *Medadhātu* only. The remaining portion of *rasa dhātu* being very little in quantity is not enough, to nourish the *rakta* and other *dhatu* ⁽¹⁴⁾.

This increase of *Meda dhātu* is similar to the increase in *vata* and others, "that which has under gone increased first will under gone further increase" (not other). On this analogy there will be discrepancy between *Medas* and other *dhatu* ⁽¹⁵⁾.

Hyperlipidemia:

Hyper lipidemia, hyper lipoproteinemia, or hyper lipidemia involves abnormally elevated levels of any or all lipids and/ or lipoproteins in the blood. It is the most common form of dyslipidemia. These lipids include cholesterol, cholesterol esters, phospholipids, and triglycerides. Lipids are transported in the blood as large 'lipoproteins'.

Hyperlipidemia is divided into primary and secondary subtypes. Primary hyperlipidemia is usually due to genetic causes (such as a mutation in a receptor protein), while secondary hyperlipidemia

arises due to other underlying causes such as diabetes, thyroid disease, renal disorders, liver disorders, and Cushing's syndrome, as well as obesity, alcohol consumption, estrogen administration, and other drug-associated changes in lipid metabolism.

Lipid profile:

A lipid profile report will include the measurements of numerous substances within the blood, including:

- **Total Cholesterol** – The total amount of cholesterol (both good and bad) within the blood.
- **Triglycerides** – A type of fat molecule found within the blood.
- **High-density lipoprotein (HDL)** – A type of good cholesterol which helps to strengthen and protect the heart.
- **Low-density lipoprotein (LDL)** – A type of bad cholesterol which plays a large contributory factor to the development of clogged arteries.
- **Total cholesterol to HDL ration** – This is included on some reports, and helps the doctor to determine the risk of developing a build of plaque within the arteries (atherosclerosis). The value is determined by dividing the figure of the total cholesterol by the figure of HDL.
- **Very low-density lipoprotein (VLDL)** – A type of bad cholesterol that is capable of building up within the arteries, the reading of which is sometimes included in lipid profile reports.

Table -1 Below is a table listing the lipid profile normal values of the substances that have been talked above ⁽¹⁶⁾:

Item	Normal Values	Borderline	High Risk
Cholesterol	Up to 200 mgs/dl	201-239 mgs/dl	>240 mgs/dl
Triglycerides	<150 mgs/dl	150-200mgs/dl	>200mgs/dl
HDL (High-density lipoprotein)	>60 mgs/dl	40-60mgs/dl	<40mgs/dl
LDL (Low-density lipoprotein)	<60mgs/dl	60-100 mgs/dl	>100 mgs/dl
Total/HDL ration	<2	2-6	>6

DISCUSSION:

Agni is responsible for all metabolic activities in the body. It is responsible for any increase or decrease of *dosa*, *dhatu* or *mala*. When *agni* is decreased it will lead to various metabolic disorders at various levels and produces "Ama" (partially digested molecules) i.e. *Agni* fails to convert the *vijatiya* (non-assimilable) *dravyas* into *Sajtiya* (assimilable) one and the end products cannot be assimilated by the *dhatu*s and such products are dangerous to the body, cause various conditions according to their presence at various physiological levels. The above-mentioned pathologies can occur with *Meda Dhatu* also. Especially when *Medo Dhatwagni* is impaired and the homologous nutrients present in *Poshaka Meda Dhatu* will be in excess in circulation and this can be referred to the conditions such as *medavruddhi* and in modern concept hyperlipidaemia. This is because the *Poshaka Meda Dhatu* cannot be assimilated into *Sthayee Meda Dhatu* by *Medo Dhatwagni*. And this *poshaka meda dhatu* is also not able to provide *poshana* to *uttarotar dhatu* such as *asthi dhatu*, *majja dhatu* and *sukra dhatu*. *Medoroga* is a metabolic disease, which is encountered in routine clinical practice nowadays.

CONCLUSION:

Ayurveda is a rich source of therapeutic measures. 'Hyperlipidaemia' can be easily studied under the broad umbrella of '*Medovruddhi*'. The pathology – *medo dhatwagni mandhya* leads to excess homologous *poshaka medo dhatu* in circulation, which can be referred to the conditions such as *hyperlipidemia*. So by focusing on *agni vaishamaya* at different level we can easily revert the pathophysiology of *medovruddhi* and do the management of hyperlipidaemia.

Scope of future study- This concept can be used in future for clinical trial.

REFERENCES:

- 1] who.int/gho/ncd/risk_factors/cholesterol_text/en/
- 2] Srinivasulu M. Concept of Ama in Ayurveda. 1st ed. Varanasi: Chaukhamba Sanskrit Series Office; 2005. p.4.
- 3] Sushruta Samhita (Ayurvedatattva and dipika Hindi Commentary), Vol. 2. Ambikadatasastri, editor. 1st ed. Varanasi Chaukhamba Sanskrit sansthan; 2009. uttaratantra, 40/169. p.306.
- 4] Charaka Samhita (Vidyotini Hindi Commentary), Vol. 2. Shastri KN, Chaturvedi GN, editors. 1st ed.

Varanasi: Chaukhamba Bharati Academy; 2004. Chikitsa sthana, 15/56-57. p.462.

- 5] Charaka Samhita (Vidyotini Hindi Commentary), Vol. 2. Shastri KN, Chaturvedi GN, editors. 1st ed. Varanasi: Chaukhamba Bharati Academy; 2004. Chikitsa sthana, 15/2. p.452.
- 6] Singh RH. The Holistic Principles of Ayurvedic Medicine. of Singh RH, 1st ed. Delhi: Chaukhamba Sanskrit Pratishthan; 2003. p.28
- 7] Charaka Samhita (Vidyotini Hindi Commentary), Vol. 2. Shastri KN, Chaturvedi GN, editors. 1st ed. Varanasi: Chaukhamba Bharati Academy; 2004. Chikitsa sthana, 15/39-40. p.459. .
- 8] Charaka Samhita (Vidyotini Hindi Commentary), Vol. 2. Shastri KN, Chaturvedi GN, editors. 1st ed. Varanasi: Chaukhamba Bharati Academy; 2004. Chikitsa sthana, 15/50-51. p.461.
- 9] Charaka Samhita (Vidyotini Hindi Commentary), Vol. 2. Shastri KN, Chaturvedi GN, editors. 1st ed. Varanasi: Chaukhamba Bharati Academy; 2004. Chikitsa sthana, 15/16-17. p.454.
- 10] Charaka Samhita (Vidyotini Hindi Commentary), Vol. 2. Shastri KN, Chaturvedi GN, editors. 1st ed. Varanasi: Chaukhamba Bharati Academy; 2004. Chikitsa sthana, 15/39. p.459.
- 11] Charaka Samhita (Vidyotini Hindi Commentary), Vol. 2. Shastri KN, Chaturvedi GN, editors. 1st ed. Varanasi: Chaukhamba Bharati Academy; 2004. Chikitsa sthana, 15/15. p.455.
- 12] Sushruta Samhita (Ayurvedatattvasandipika Hindi Commentary), part 1. Ambikadatasastri, editor. 1st ed. Varanasi Chaukhamba Sanskrit sansthan; 2009. Sharira sthan, 4/12-13. p.39.
- 13] Charaksamhita Ayurveda-Dipika Commentary by Cakrapanidutta Publisher Chaukhamba Surbharati Prakashan, Varanasi edition 2005, Chikitsa Sthan 15/16, Page no. 514.
- 14] Astanga samgraha of Vagabhatta volume 1, prof. K. R. Srikanthamurthy, Sutrasthan, 24/23-24, p.424.
- 15] Astanga samgraha of Vagabhatta volume1, prof.K.R. Srikanthamurthy, Sutrasthan, 19/11-13, p.359.
- 16] Essentials of Medical Physiology of K Sembulingam and Prema Semhulingam, Jaypee Brothers medical publishers (p)LTD, Volume 6, p 297.

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