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The critical appraisal of *Medovaha Srotas*: A comprehensive review of conceptual framework, clinical implications and contemporary perspective

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ABSTRACT

Objectives: This review article elaborates *Meda Dhatu*, *Medovaha Srotas* and possible *Samprapti* and its relevance to the contemporary sciences and consequences of disorders produced due to its *Dusthi*, so that a clear understanding of all these, helps in searching out more diagnostics and treatment protocols. **Data Sources:** The classical Ayurvedic texts along with the commentaries, modern science books and internet. **Review Methods:** The classical information collected is further analysed and tried to collates according to the modern medicinal knowledge and concluded as per the author's view. **Results:** Proper diagnosis is very important for providing proper treatment and cure of disease. *Medo Dhatu Dhusthi* is present in almost all the non-communicable diseases in today's era which is the major cause of death worldwide. *Medo Dhatu* when collates with the modern science corresponds to the lipids and its *Dusthi* corresponds to the disorders due to lipid metabolism. *Medo Dhatu Dushti* leads to a vicious cycle of pathogenesis leading to many lifestyle disorders and this pathogenesis can be understood by the *Samprapti* of *Sthaulya Roga* as per *Ayurveda*. **Conclusion:** *Medo dhatu* and *Medo Vaha Srotas* along with *Samprapti* of its *Dushti* and diseases occurring due to this, needs critical understanding in today's era of urbanisation. Due to Increased burden of non-communicable diseases, it is the need of an hour to elaborate more about these fundamentals, so that new treatment protocols and diagnostics can be found out. *Ayurvedic* texts has lot of explanation about all these. We require to analyse and use that knowledge for the benefit of mankind.

Key words: *Medodhatu*, *Medodhatu Dushti*, non-communicable diseases

INTRODUCTION

Srotas are the minute channels in the body, that aid in transportation and transformation of various *Dosha*, *Dhatu* and *Mala*. The word *Srotas* is derived from the root word '*Sru Gatau*' which means the movement, flow, secreting etc. *Srotas* defined by *Acharya Sushruta*

as small hollow spaces or channels, originating from the root and spreading in the entire body like the roots of the lotus flower.^[1] The importance of *Srotas* is very significantly explained by *Acharya Charaka* by giving an entire chapter on it. There are total 13 *Srotas* given by *Acharya Charaka*^[2] and 11 pairs by *Acharya Sushruta*.^[3] Out of the 13 *Srotas* explained, the 3 *Srotas* - *Pranavaha*, *Udakvaha* and *Annavaha Srotas*, are responsible for in taking of the sources of energy from the nature in the form of *Vayu*, *Soma (Jala)* and *Agni* respectively. The successive seven *Srotas* - *Rasavaha*, *Raktavaha*, *Mamsavaha*, *Medovaha*, *Asthivaha*, *Majjavaha*, *Sukravaha Srotas* are responsible for doing nourishment or *Poshana* of the body, by transforming the energy in suitable forms that can be utilized by the body. The last three *Srotas* - *Mutravaha*, *Purishvaha* and *Svedavaha Srotas*, are carrying out the work of excreting the *Mala*, out of the body in three forms, *Mutra*, *Purisha* and *Sveda*. Hence the *Srotas* carry out

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the entire physiological functions of the body and maintain the health of a person by performing or aid in performing the function of in taking, utilization and excretion. For normal functioning of the body, normal functioning of *Srotas* is very essential. Any vitiation from normalcy, leads to production of many diseases.

In today's era of urbanization, the prevalence of non-communicable disease is increasing day by day and in all these disorders, the involvement of *Meda* and *Medovaha Srotas* can be seen directly or indirectly. Acc. to WHO, NCDs kill 41 million people each year and out of this 17 million die before the age of 70 years and 77% are from low- and middle-income countries^[4] Such a huge burden needs urgent attention for better understanding of this disease and for making improvements in diagnostics and treatment protocols.

REVIEW OF LITERATURE

Meda is one of the *Sapta Dhatu*, maintaining the *Snigdhta* in the body. *Meda* is *Matreya Bhava*^[5] and it is formed when the *Mamsagani* acts on the *Mamsa Dhatu*.^[6] It has *Vata* pacifying, *Kapha* and *Pitta* increasing properties. It gives *Bala*, *Sneha* to body and heavy to digest. It does *Bramhana* to the body.

Table 1: Root of Medovaha Srotas according to different Acharya

Acharya Charaka	Vriika and Vapavahna ^[7]
Acharya Susruta	Vrikka and Kati ^[8]
Acharya Vagbhat	Vrikka and Mamsa ^[9]

Vrikka: it is explained as one of the *Kosthanaga*^[10] and is developed from the *Prasada Bhaga* of *Rakta* and *Meda*.^[11] Acharya Susruta explained that *Vrikka* is the "*Mamsapindadvayama Eko Vamprashav, Divitya Dakshin Parshavsthitva*".^[12]

Vapavahana: is the *Snighda Vartika* or *Taila Vartika*^[13] present in the *Udara* region.

Kati is the waist area.

Mamsa is the *Dhatu* from where the formation of *Meda Dhatu* is taking place.

Dushti Nidaan:^[14]

- *Avyama:* Not doing physical activity that produces tiredness in the body.
- Day sleeping: Due to increase in *Snighda Guna*.
- *Medovardhaka Anna Panna:* Which is rich in oils, *Madhur*, *Amla*, *Lavana Ras* and *Sheeta* in *Virya*.
- *Varuni Ati Sevana:* Acc. to acharya *Susruta Varuni* is similar to *sura* in properties^[15] i.e. it is *Laghu*, *Tikshan*, *Vibandha Har*, *Brahmna* and *Deepna* etc. When taken in excess quantities, the increased appetite, will leads to increased consumption of food that leads to increase of *Meda Dhatu*.

Dushti Lakshana

"*Ninditani Prameha Purvaroopani*"^[16]

Acharya *Charaka* mentioned the *Lakshan* of *Medo Dushti* as *Prameha Poorvaroopa* and *Astha Nindita*.

Acharya *Chakrapani* explained in the *Teeka* the meaning of *Nindita* as *Astha Nindita Dosha* of *Ati Sthula Purusha*.

Table 2: Dusthi Lakshan by Acharya Charaka.

<i>Prameha Purva Roopa: acc. to Acharya Charaka</i>	<i>The Astha Dosha of Ati Sthulya Purusha: acc. to Acharya Charka</i>
1. <i>Jatilibhavam Kesheshu</i>	1. <i>Ayuso Hraso</i>
2. <i>Maduram Asyata</i>	2. <i>Javouprodh.</i>
3. <i>Karopadyo Suptata and Daha</i>	3. <i>Krichravavyata</i>
4. <i>Muka, Talu, Kantha Sosha</i>	4. <i>Daurbalyam</i>
5. <i>Pipasa</i>	5. <i>Daugandhyama</i>
6. <i>Alasyama</i>	6. <i>Svedabadha</i>
7. <i>Mala Kaya</i>	7. <i>Ksruta Ati Matram</i>
8. <i>Kaye Chidro Updeha</i>	8. <i>Pipasa Atiyoga.</i>
9. <i>Paridaha Suptata Angeshu</i>	

10. <i>Mutra cha Mutra Dosha</i>	
11. <i>Visra Gandha</i>	
12. <i>Nindra</i>	
13. <i>Tandra cha Sarvakala</i>	

Table 3: *Vidha Lakshana by Acharya Susruta*

<i>Vidha Lakshana of Medo Dhatu: acc. to Acharya Susruta</i> ^[17]
1. <i>Svedaagmana</i>
2. <i>Snigdha Angta</i>
3. <i>Talushosha</i>
4. <i>Sthoola Shophra</i>
5. <i>Pipasa</i>

DISCUSSION

Meda is one of the important *dhatu*, responsible for maintaining the body by imparting *Snigdhatu* to it. It has 2 *Updhatus*, *Sandhi* and *Snayu*.^[18] *Sveda* is the *Mala* of *Meda Dhatu*.^[19] It has *Anjali Pramana* of 2 *Swamya Anjali*.^[20] *Acharya Sushruta* has given *Medodhara Kala* as third *Kala* present in the *Udar* and *Anu Asthi* of the body.^[21] It is also present in large *Asthi* in mixture with *Rakta Dhatu*. *Acharya Chakrapani* has explained two types of *Dhatu*, *Sthayi Dhatu* and *Asthayi Dhatu*. *Sthayi Meda Dhatu* can be correlated with adipose tissues of the body and *Asthayi Medo Dhatu* with lipids.

Asthayi Dhatus are always in motion and they being transferred from one place to another in their respective *Srotas*. Any vitiation, increase or decrease in the quantity and quality of the *Dhatus*, firstly appears in the *Asthayi Dhatus* then the *Sthayi Dhatus*, just like in anemia, the iron stores get depleted in chronic stages. Here also the *Asthayi Medo Dhatu* which can be taken as lipids is always in movement via blood. The diseases produced by *Sthayi Medo Dhatu* and *Asthayi Medo Dhatu* will also be different.

1. *Vrikka* can be correlated with kidneys and adrenal gland. As kidney have coverings of fatty tissues in the form of Para nephric fat followed by peri renal

fat and renal sinus fat in the form of *Sthayi Meda Dhatu*. Adrenal gland present on the top of kidneys is involved in metabolism of lipids with the help of its various hormones, like epinephrine.

2. *Vapavahna* which is the *Snigdha Vartika* that can be taken as omentum which is the large peritoneal fold attached to the stomach and acts as store house of fat.
3. *Kati* region has lot of adipose tissue and deposition of fat can be seen very first in the *Kati* region.
4. *Mamsa Dhatu* is the muscular tissue and it is taken as *Moola Sthana* due to the fact that muscles use fat as a source of energy and fat can be burnt inside the body by the muscles.

Samprapti: The pathogenesis of *Medo Dusthi* and *Medo Vaha Srotas Dusthi* can be understood with the help of pathogenesis of *Shoulya*. The consumption of *Nidana*, that is excess of *Medo Vardhaka Aahra vihara* leads to increase in *Medo Dhatu*. *Medo Dhatu* has property of accumulation inside the hollow paths and it leads to partial and complete obstruction of lumen of the *Srotas*. It also changes the morphology and structure of the channel, decreasing the elasticity and functioning of the *Srotas*. As *Srotas* are involved in transformations and transportation of various *Dhatus*, the *Dhatus* after *Meda*, will be formed in low quantity and quality, leading to decrease in the functions related with them. Obstruction of *Srotas* will hamper *Medo Agni* and less amount of *Asthi Dhatu* will be formed. Obese patients present early with complaints of joints pain due to this reason along with erosive osteopenia. The successive formed less *Majja Dhatu* will cause *Pandu* and symptoms related to it like *Daurbalyam* and *Swasa Roga*. Where decreased *Sukra Dhatu* is directly leading to infertility, hampered *Sukra Agni* will also degenerate male and female hormones, leading to increase in female and male hormones in males and females respectively. In contemporary science also, it is also hypothesized that the sperm quality may be directly affected by fat redistribution in the liver and increased systemic levels of inflammation. Increased amounts of adipose tissue in the groin and scrotal areas may increase local testicular

temperature to a level that further affects sperm quality.^[22] Till this, *Anuloma Kshya* is taking place, but when *Sukra Dhatu* level goes down, the *Partiloma Kshya* will also be started leading to a vicious cycle of pathogenesis which is difficult to break.

The accumulation of *Meda* inside the *Srotas* of *Mutra*, *Purisha* and *Sveda* will lead to 5 type of pathological changes inside them viz. *Sanga*, *Atipravriti*, *Bheda*, *Sosha* and *Pradushna*. The *Dusthi* of *Mutravaha Srotas* will leads to either *Prameha Poorarupa*, *MutrAGRAnthi*. The *Dusthi* of *Purishvaha Srotas* will leads to *Vibandha* and it will cause *Udavarta* and *Apana Vayu Dusthi*. *Apana Vayu Pratiloma Gati* will vitiate *Prana Vayu* and leading to many *Vata* disorders like *Uccha Raktachaapa*, *Ekangavata*, *Pakshagata*, *Ardita* and many more. The *Dusthi* of *Svedavaha Srotas* in the form of *Sanga* is due to insulating properties of fat, that will prevent loss of heat from the body in the form of *Sveda*. The physiological function of *Sveda* which is to maintain the *Kleda* of skin, excreting the *Mala*, maintain the normal body temperature will also be affected leading to accumulation of *Mala* inside the skin or body. This leads to many skin diseases in the form of *Kustha* and *PremeHa Pidika*. *Atipravriti* type of *Dusthi* of *Svedavaha Srotas* occurs when there is excess of *Meda* inside the body, which has not yet accumulated inside the *Sveda Vaha Srotas*. As *Sveda* is the *Mala* of *Medo Dhatu* excess sweating will occur. This leads to foul smell from the body.

While looking at the NCDs, *Medo Vaha Srotas Dusthi* is very significantly observed. All the major NCDs, be it cardiovascular, hypertension, dyslipidemias, diabetes, are due to the *Medo Dusthi*. In contemporary sciences, there are major three types of lipids present in the blood, cholesterol, fatty acids and triglycerides. Since these are insoluble in water, they are carried with the help of lipoproteins in the blood. Cholesterol is an essential component of the cell membranes, and is necessary for synthesis of steroid hormones, and for the formation of bile acids.^[23] Cholesterol is synthesized by liver and many other organs, and is also ingested in the diet in very small amounts. Majority of Cholesterol is formed inside the body. The fecal excretion of bile salts is the only route for the excretion

of cholesterol from the body. Triglycerides are lipids in which three long-chain fatty acids are attached to glycerol. Triglycerides serve as a source of energy. They are present in dietary fat and also synthesized by liver and adipose tissue. While carbohydrates and proteins can be utilized for making fatty acids inside the body, the vice versa cannot occur. Fat serves as concentrated sources of energy and are easy to store. All cells store some triglycerides but adipose tissue is the major site.

Epinephrine and glucagon that increases CAMP concentration increases lipolysis and insulin that lowers CAMP, lowers lipolysis. Triglycerides are degraded into free fatty acids and glycerol. Free fatty acids are utilized by the tissues for energy production and glycerol is reutilized for triglycerides synthesis. Fats can be burnt in the muscles only. That's the reason that our *Acharyas* has put the *Mamsa Dhatu* as *Moola* of *Medo Vaha Srotas* and regular muscular activity which is *Vyama* is required for losing the fat and dieting merely do that and hence *Guru Apatarpana* is advised. One of the *Nidana* mentioned by the *acharya charka* of *Sthoulya* is the *Beej Dosh*. In contemporary sciences also, fat regulating center fixes the fat set point. Higher the fat set point, high amount of stored fat in the e body and vice versa. This fat set point is determined by our genes, although our habits can change it. *Virechana* is mentioned as one of the treatment protocols of *Vata Vyadi*, *Kustha*, *Prameha* and all other major *Santarpan Janya Vyadhi*. We have seen in the contemporary sciences that bile is the only way to excrete cholesterol from the body.

CONCLUSION

Meda is one of important *dhatu*s. The *Srotomoola* of *Medovaha Srotas* are given scientifically by our *acharyas*. Understanding of *Dushti* of *Medo Vaha Srotas* is very important in today's era. Majority of lifestyles disorders and non-communicable diseases occurring today, are results of eating *Medo Vardhaka Ahaar Vihar* and it is leading to vicious cycle of disorders, for which there is a need to find new methods of diagnosis and treatment. *Virechana* plays an important role in all *Santarpan Janya Vyadhi*.

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