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MEDA DHATU (BODY FAT): A REVIEW

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Abstract: Medadhatu (body fat) is formed from mamsadhatu (muscles). The nutrients required to form medhadhatu are present in mamsadhatu. These nutrients get metabolized with water and form medhadhatu. Medhadhatu is snigdha (oily) and soft. Medasdhathu refers to the fatty tissues of the body. While the term can literally be translated to mean fat, conceptually it means the concentrated waters of the body. In the physical body, in addition to body fat the medasdhathu relates to sebum (skin oil) and the greater and lesser omentum which are its updhathu. These tissues are the primary storage sites for excess body fat in the abdomen. Medasdhathu is formed as posakamamsadhatu flows into the medodharakala and is digested by the medagni. The waste products produced by the formation of medasdhathu are the skin secretions of sweat and sebum (oil). In this article derivation of meda, formation of medadhatu, sthana and swarupa of medadhatu, difference between medas, vasa, majja, vapa and sneha, quantity and qualities, function of medadhatu, ashrayashrayeebhava of medadhatu, medovahasrotas will be described.

Key Words: Medadhatu, Body fat, Ashrayashrayeebhava, Medovahasrotas.

Introduction: Meda is Dhatu in sequence of Sapta Dhatu and is heavier than previous Dhatulike Rasa, Rakta, Mamsa (Ch.Su.27/337)^[1]

Derivation of Medas Dhatu: Literally, the word Meda is derived from root "JhimidaSnehana". Which stands for Sneha, Fat, Oil etc. (Vachaspatyam~) ^[2] with the help of suffix 'Asun', some has directed 'Ach' suffix. It means the substance, which has Snigdhavta property, is called Meda. There are many oily substances in the body like Vasa, Majja etc.

Definition of Meda: In Shabdakalpdrum ^[3], it is mentioned that Meda is the fourth Dhatu, which performs the DharanKarm-support the body, mind and life.

According to Charak

Meda: Fourth Dhatu-heavier than Rasa, Rakta and Mamsa (Ch.Su 27/337) ^[4].

According to Sushruta

Meda: Fourth Sneha which derives from Jangama origin. (Su.Su 45/131) ^[5]

Synonyms of Meda

Mamsaj, Mamseteja Asthi Kruta

Vasa, Vapa, Goda, Gautama

Fat cells have an important physiological role in maintaining triglyceride and free fatty acid levels, as well as determining insulin resistance. Abdominal fat has a different

metabolic profile—being more prone to induce insulin resistance. This explains to a large degree why central obesity is a marker of impaired glucose tolerance and is an independent risk factor for cardiovascular disease (even in the absence of diabetes mellitus and hypertension). ^[6]

Materials and Methods

The Literary material related to obesity has been collected from Several Ayurvedic texts like Charakasamhita, Sushrutsamhita, Ashtang Sangraha, etc.

Formation of Meda Dhatu: According to Charaka, the RaktaDhatu is combined with Teja, Jala and Vayu made solid by the Agni so that it gets converted into Mamsa, that again being digested by its own Agni, "Medodhatvagni" and stirred up by the Agni and getting combined with the quality of Apa and unctuous substances and finally gets converted into the Medodhatu. Further, Meda is a combination of Jala, Prithvi and Teja Mahabhuta (Ch.Chi. 15/29-30) ^[7].

Meda is also considered as a Sneha dominant Drava Dhatu. The Sthira Dhatu Mamsa converts in to Drava Dhatu Meda with the help of MamsaDhatvagni, while Drava & Snigdha Dhatu Meda converts in to further Dhatu Asthi with the help of Medodhatvagni.

According to *Charaka Samhita* (Chi. 15/21-22) [8]. *Dhatu Parinamana Kala* is mentioned as 7 days. So, formation of *Meda* in sequential process takes days. While other texts have considered *Dhatu Parinamana Kala* of one month and in this consequence formation of *Meda* takes place after 15 days and 108 minutes (Sa. Pu.6/10) [9]. According to another principle, its formation takes place in *Medovaha Srotas* with the help of *Vrkka*, *Vapavahana* and *Kati* as these are considered as the root of *Medovaha Srotas* (Ch.Vi. 5/8) [10]. Other opines that formation of *Meda* takes place in *Medodhara Kala* i.e. adipose tissue itself (Su. Sa. 4/13) [11], which is now supported by modern physiology too.

Sthana and Swarupa of Meda Dhatu: The third *Kala* is called *Medodhara Kala*. Most of *MedasDhatu* resides here. This *Medodhara Kala* is seated all over body below the skin and above *Mamsdhara Kala* except scrotum, eyelids and few other places. *Udara*, *Sphik*, *Stana*, *Gala* etc. are the specific depots of *Meda* (Ch. Su. 21/8) [12]. In *Yauvanavastha* its accumulation accentuates more in *Sphik* and *Stana* region of females Excessive accumulation of *Meda* in this regions cause different symptoms of *Sthaulya* like *Calatva*, *Saithilya* etc. The other site of its deposition is small bones. Since the origin of *MedovahaSrotas* are *Vrikka* and *Vapavahan*, so most of *Medas* is deposited in *Vapavahan*, abdomen and skin underneath.

According to *VaidyaRanjeetRaiDesai*, in body *MedasDhatu* is found in micro form irregular pieces called *Medanu* i.e. fat cells. The diameter of *Medanu* is between 1/500 to 1/400 inches. They are full with *Medas*. In living condition the *Medas* found in form of liquid, which becomes concentrated after death. According to modern view *Medas* is derived from digested fat, carbohydrate and non-nitrogenous protein. So *Medas* is that fatty content of body, which can not be taken from out side and which is originated after digestion and metabolism of different diet materials.

Difference between Medas, Vasa, Majja, Vapa and Sneha

- *Medas* is fourth *Dhatu* of body, originated and carried by *Medovah Srotas* and deposited in *Medhodhara Kala* and small bones. The *Medas* residing in bones is called '*Sarakta Medas*'.
- *Majja* is sixth *Dhatu* which resides in long bones only. It does not have any *Kala* for its deposition. It is originated from *Asthi Dhatu*. When *Vayu* makes bone hollow, that hollow

part is filled by *Sneha*. Which is called *Majja*. According to modern medicine bone have two types of marrow i.e. red and yellow, The *Ayurveda*, thus accepts the red marrow as *Sarakta Medas* and yellow marrow as *majjadhatu*.

- *Vasa* is the *Sneha* or lubricant of pure *MamsaDhatu*. It is *Updhatu* of *Mamsa Dhatu*. It is stored form of fat. When it departs in abdomen, it is termed as *Vapa*, while *MastakaSneha* or *Mastulunga* is known as *Goda*. The terms *Vapa* is used at the place of *Medas* but it is more often used as literary than a conceding *Ayurvedic* term, where it is clearly started for a body organ "*Vapa*", Probably this nomenclature has similarity of meanings, came by similarity of function of *Vapa* as to be a prominent site and origin of *MedovahSrotasa*.

This term is also used as a type of *Sneha* viz. 1. *Ghrita*, 2. *Taila*, 3. *Vasa* 4. *Majja*. This all can be taken by mouth but *Medas* and *SaraktaMedas* can not be taken by mouth. This division clearly differentiate the *MedasDhatu* from *Snehas*.

Quantity of Medas Dhatu: The total quantity of *MedaDhatu* is two *Anjali*, the *Vasa* (Muscle's fat) is three and the *Majja* is one *Anjali* total *Meda* content of body is enumerated as 6 *Anjali* and total measurable body elements are counted as 56. 5 *Anjali* From this proportion, it is evident that total *Meda* content of body is 11% approximately. Modern physiology also mentioned the same amount of fat. This quantity may vary from person to person. In *Padmapuranait's* quantity is given in the term of *Adhaka*. Probably other compendia are silent on this topic.

Qualities of Meda Dhathu

<i>Snigdha</i> (unctuous)	<i>Slakshna</i> (smooth)
<i>Guru</i> (heavy)	<i>Mrudu</i> (soft)
<i>Sandra-Drava</i> (thick liquid)	<i>Pita</i> (yellowish colour)
<i>Apya</i> and <i>Parthiva</i> properties	

Function of Meda Dhatu: According to *Sushruta* (Su.Su. 15/5) [13], *Sneha*, *Swedautpatti*, *Drudhatva* and *Asthipusthi* are the functions of *Medadhatu*. Again *Netra* and *Gatrasnigdhata* are the additional functions of *Meda* mentioned by *Astang Samgraha* (A.S.Su. 19/4) [14]. *Snehana* is the main function of *Meda Dhatu* and with *Sneha* property it helps to keep luster of skin, hair, eye, etc. *Snigdha Gatrata* symptom of *Sthaulya* may arise through increased *Snehana* function of *Meda*.

Another function of *Meda* is nourishment of further *Dhatu Asthi* and *Updhatu*

Snayu and *Sandhi*. *Snayu* and *Sandhi* both are directly related with the *AsthiDhatu*. In *Charaka Samhita* *Snayu* and *Sandhi* are mentioned as *Upadhatu* of *Meda* (Ch.15/17) ^[15], *Snayu* provides support to the *Asthi* and *Sandhi* helps in joint formation.

Vataghna and *Bala-Pitta-Kapha Kara* properties of *Vasa*, *Majjah*, *Mamsa* and *Meda* are mentioned (AS.Su.6/112) ^[16] and *Meda* is included under *Madhura Skandha* (As.Su.18/20) ^[16]. In *Kashyapa Samhita*, *Madhura Rasa & Madhura Vipaka*, *Vita-Pitta Hara* and *Kapha Kara* action of *Meda* & *Vasa* are mentioned (Khi.24/60) ^[17]. It is considered as seat of *Kapha* (Ch.Su.20/8), root of *Asthivaha* and *Svedavaha Srotas* (Ch.Vi.5/8), *Matrja Bhava* (Ch.Sa.3/6).

Ashrayashrayeebhava of Meda: *Dhatu*, which is the shelter for any *dosa* of its allied nature, depicts the concept of *Ashryashrayeebhava* (A.H.Su.11/27) ^[18]. Similar allied properties of homogenous *Dhatu* or *Dosha* may serve as a cause to the nutrition of variation of a *Dosa* or *Dhatu* and it is in this context *Meda* can be considered as a location of the resident *Kapha*, since *Meda* plays a major role in nutrition or vitiation of *Kapha* and vice versa.

Medovaha Srotas: The channels which supply nutrition of *Medadhatu* is known as *Medovaha Srotasa*.

Moola of Medovaha Srotas: Each and every *Srotas* has two parts, Ending one is from which the *Srotasis* originated i.e. the *Moola* and another is through which nutritive material travel to their

Doshaja Lakshana of Medas Dhathu (Murthy, K.S., 2003) ^[20]

<i>Medasta</i>	<i>Vata-</i>	<i>Kharatwa</i> (Roughness)
		<i>Stambha</i> (Stiffness)
	<i>Pitta-</i>	<i>Sadaha Granthi</i> (Tumour with burning sensation)
		<i>Sweda</i> (Perspiration)
		<i>Trisha</i> (Thirsty)
		<i>Chardhi</i> (Vomiting)
	<i>Kapha-</i>	<i>Sthaulya</i>
		<i>Prameha</i>

Discussion and Conclusion: In order to produce healthy *medas dhatu*, adequate earth and water must be consumed through the diet. Consumption alone does not guarantee that healthy *medas* will be formed. The two elements must be properly digested so that their qualities can be used to build body fat. Thus, *jatharagni* (main digestive fire) must be healthy. If it is not healthy, rather than forming healthy *medas dhatu*, these same foods will produce *ama* and toxify the body and mind. Finally it can be conclude that

respective places in the body. According to three *Acharyas* root may be enumerated as under:

- *Charaka-Vrikka* and *Vapavahana*
- *Sushruta-Vrikka* and *Kati*
- *Vagbhat-Vrikka* and *Mamsa*

Vrikka: *Vrikka*, one of the *Kosthanga* formed by the *Sara* of *Rakta* and *Meda Dhatu*. There are two *Vrikka*, situated in both side of the midvertebro line inside the abdominal cavity. *Sharangadhara* says that they nourish the *Meda Dhatu* inside the stomach area of the abdominal cavity (Sha. Pu. 5/84) ^[19] while *Charaka* has considered as “*Moola*” so these structures must be directly related with fat metabolism. But, there is no such exact evidence in Modern science as well as *Ayurvedic* Science. If we take into the consideration of two structures situated above the two kidneys i.e. *Supra-renal glands* as *Vrikka* that fulfils the all aspects of fat metabolism.

Vapavahan: *Vapavahan* is also a *Kosthanga* and second root of *Medovaha Srotas*. *Chakrapani* has interpreted it as *Tailavartika* while Dr. *Ghanekar* has considered as omentum, where the maximum *Meda* is stored.

Kati: *Acharya Sushruta* has clearly pointed out the exact site of the *Kati* but normally the *Kati* is the place where the fat accumulates.

Mamsa: *Vagbhata* has considered *Mamsa* as the *Moola* of *Medovaha Srotas*. It is not easy to explain correctly. But we might have consider the *Vasa* (*Mamsagata Sneha*) below the skin and as such the entire skin may be considered as the *Moola* of *Medovaha Srotas*.

(body fat) *medadhatu* as described in *Ayurvedic* literature are more or less similar to the modern description.

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