

**“STUDY OF MEDODHARA KALA WITH SPECIAL REFERENCE TO
STHOULYA (MEDOROG).”**

Vd. Dr. Jayshri N. Tayade^{1*}

¹BAMS MD Rachana Sharir, Assistant Professor.

Article Received on
06 July 2023,

Revised on 06 August 2023,
Accepted on 26 August 2023

DOI: 10.20959/wjpr202315-29544

***Corresponding Author**

Vd. Dr. Jayshri N. Tayade

BAMS MD Rachana Sharir,
Assistant Professor.

ABSTRACT

Anatomy is branch of science which is concerned with the body structure of human. *Sushruta* mentioned seven type of *Kala*. *Kala* is present in the body these are limiting membranes in between *Dhatu* (*Rasa, Raktadi*) & *Ashaya* or the layers which separates the muscle tissue from cavity of organ are called *Kala*. Among seven *Medodhar Kala* is the third *Kala* which is situated in *Udar* (abdomen), *Anuasthi* (small bones) and *Maha Asthi* (long bones). It may be compared with membrane covering which protects adipose tissue depots. It has functions like protection of organs, shock absorber like activity etc...

The knowledge of *Medodhara Kala* helps in understanding various concepts related to *Meda*. *Sushruta* described site for *Medodhara Kala* where large quantity of (*Meda*) fat have deposited. So, fat deposition may be tendency of *Medodhara Kala* taking these into consideration functionally the adipose tissue & fatty layers of the abdomen should be correlates with *Medodhara Kala*. Adipose tissue forms thick layer under the skin, around the kidneys & in the buttocks. Deterioration of functioning of *Medodhara Kala* leads to deposition of *Apachita Meda* leading to *Sthoulya*. In obesity, abdominal wall, space between organs stores much amount of adipose tissue (site of *Meda* deposition). So, this article reveals with Study of *Medodhara Kala* with special reference to *Sthoulya*.

KEYWORDS: *Medodhara Kala, Sthoulya, Apachita Meda.*

INTRODUCTION

Ayurveda is the science of life explains all concepts to obtain healthy life along with maintenance of health. Individual having ideal characteristics with proper measurements of various parts of body nomenclated as *Prashastha Purusha* (healthy individual). Variation from the characteristics is *Aprashsta* i.e., *Nindya* (unhealthy).^[1] *Atisthool* is one among them

which further causes multiple systemic disorders and finally affect longevity of life. According to Acharya Charaka, *Medo Dhatu Vriddhi* is etiological factor for *Sthoulya*.^[2] *Dhatu* are seven functional elements of the body functioning in various ways for maintenance of homeostasis. *Medodhatu* (adipose tissue/fat) when synthesized in excessive amount and not get properly metabolized (*Apachita meda*) deposited in *Udara Pradesha* (abdomen) leading to *Sthoulya*. also, *Udara* (abdomen) is site of *Medodhara Kala*.^[3]

As *Kala* is the structure limiting *Dhatu* and *Ashaya*, *Medodhara Kala* is membranous structure located between *Medodhatu* and *Ashaya*. *Sthoulya* is included in *Medovikara* and also in *Santarpanotha Vikara* condition (due to over nutrition).^[4] Pathogenesis involves deranged metabolism of *Meda* leading to sustain *Apachita Meda* which restrict formation of other *Dhatu* build up causing other systemic disorders. As per Ayurveda, *Medodhara Kala* is membrane like structure involved in *Sthoulya*. This *Kala* can be compared with visceral fat depot.

AIM: Study of *Medodhara Kala* with special reference to *Sthoulya*.

OBJECTIVES

1. Exploration of *Medodhara Kala*.
2. To study correlarion of *Medodhara kala* with modern science.
3. To study importance of *Medodhara kala* in *Sthoulya Vyadhi*.

METHODOLOGY OF STUDY

Literature research through *Bruhatrayis*, *Laghu Trayees* as well as modern anatomy and physiology textbooks, along with websites and published articles.

Review of Literature

1. Kala

A layer or membrane that separates a *Dhatu* (fundamental elements) from its *Asaya* (storage site) is defined as *Kala*.^[5] *Kala* appears like *Snayu*, *Jarayu*, or *Kapha* based on their different locations.^[6] *Kala* is formed by *Pachana* of *Kleda* (located between *Dhatu* and *Ashaya*) by *Swa-Ushma* (*Dhatu Agni*).^[7] *Kala* is arranged around a *Dhatu* just like annual rings of a tree.^[8] *Sushruta* mentioned seven type of *Kala* named as *Mansdhara Kala*, *Raktadhara Kala*, *Medodhara Kala*, *Shleshmadhara Kala*, *Purishdhara Kala*, *Pittadhara Kala*, & *Shukradhara Kala*.^[9]

Sites of Medodhara Kala

Udara - can be peritoneum, omentum, mesentery and other fatty tissues.

Anu Asthi - small bones inner matter is *Saraktha Meda*, nothing but redbone marrow.

Maha Asthi - same *Meda* is called as *Majja* -bone marrow.

Kapala Pratichanna - *Mastishka* - *Masthulungakhya* - meningeal layers of brain.

Concept of Vapa & Vapavahan

“Gosarpinibha peeta twachoatha sansthita cha ya /

Sheetatpasaha snigdha saa vapa parikirtita” ^[10]

Yellowish butter like structure through body called *Vapa*. It reduces heat loss through the skin.

Vapavahan

“Vapavahan medsthan tailavartiketi khyatam” --(*chakrapani*)^[11]

It is also *Kosthang* & second root of *Medovaha Strotas*. *Chakrapani* has interpreted as *Tail Vartika* while Dr. Ghanekar has consider it as omentum where maximum fat accumulates.

Medo Dhatu

Medo Dhatu is formed from *Mamsa Dhatu*, and is *Guru*, *Snigdha*, *Dridha*, and *Poshaka* (nourishing element) of the body.

Upadhatu

According to *Acharya Charaka*, *Upadhatu* of *Medas* is *Snayu*.^[12]

Medovaha Strothas^[13-15]

The *Moola Sthana* of *Medo Vaha Strotas* are *Vrikka* (kidneys), *Vapa Vahana* (*Snigdha Varthika* of *Udara*) and *Kati*. *Vagbhatacharya* added *Mamsa* as *Strothomoola* of *Meda*.

Site of Medo dhatu

Medodhatu located on *Udar*(abdomen), *Anu Asthi* (small bones) so, excess fat deposited over abdomen of fatty person.

Medo Dhatu formation and Metabolism^[16]

Meda Dhatu is formed from the unctuous portion of *Mamsa-Dhatu* by action of factors responsible for metabolism of *Meda* (*Medadhatvagni*)

There are two forms of *Meda Dhatu* in body:

1. Structural component (*Poshya Meda Dhatu*): It is the form, that is stored in the layer of *Meda* (*Medodhara Kala*). It is also called fixed or stored fat (*Baddha Medas*). This portion is located mainly in the omentum. This form is responsible for the nutrition of *Meda Dhatu* itself in case of starvation.

2. Circulating component (*Poshaka Meda Dhatu*): This form is circulated with nutrient fluid or plasma (*Rasa Dhatu*) and blood (*Rakta*). It is free and unbound (*Abaddha Medas*). This provides lubrication and unctuousness wherever needed. This form is vitiated in the pathogenesis of obstinate urinary disorders including diabetes (*Prameha*).^[17]

Layer of Meda Dhatu (Medodhara Kala)

It is the layer of fat present in the abdominal cavity, small bones and long bones. In the abdominal cavity, it is present in the form of visceral fats. *Meda dhatu* present in the long and big bones is known as marrow (*Majja*). That present inside the small bones is termed as red marrow (*Sarakta Meda*). The unctuous portion of *Mamsa Dhatu* transforms into fat and is known as muscle fat (*Vasa*).

Meda Dhatu Vridhi^[18]

Under *Vridhi Lakshana* of *Medo Dhatu*, Acharya explained, *Maamsa Vridhi* Vat symptoms (*Gandamala*, *Arbuda*, *Granthi*, *Vridhi of Kanda*, *Uru* and *Udara*), *Snigdhangata* (excessive oiliness), *Lambana* of *Sphik- Stana- Udara*, *Udara Parswa Vridhu* (heavy breast, buttocks, abdomen and flanks) and *Alpe api Chestithe Sramam* and *Swasam* (breathing difficulty even by doing small work), *Kasa* are said. *Lambana* of *Sphik- Sthana- Udara* (fascia which covers breast). Due to the over deposition of *Meda Dhatu* oversized breast appears, as a result, ligaments lose their strength to support. Same with *Udara* (abdomen). In abdomen we are having more layers of fascia, along with increased visceral fat and sub cutaneous fat, typical obesity feature of belly happens. *Sphik* is said to be the gluteal region. Same principle applies here.

Udara Parswa Vridhi - pendulous abdomen due to fat deposition.

Alpe Api Chestithe Swasam- Kasam- Sramam - research studies show that thickened pleural covering in increased BMI in obesity, results in breathlessness even with slight exertion. Also, there can be deposition of fat around lungs, heart and other parts of thorax, which

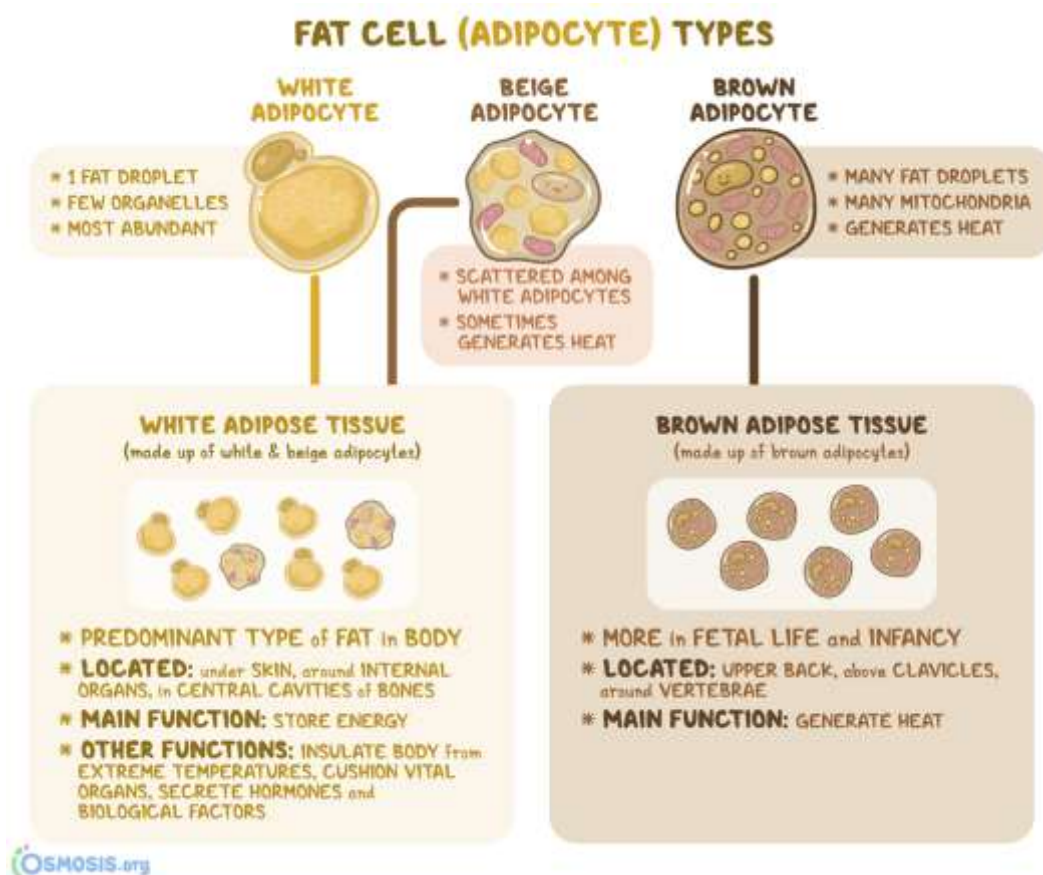
reduces the space for expansion of lungs - alveoli during breathing. *Sthoulya* (obesity), *Medodhatu* and confirmation of structure confined to *Medodhara Kala*.

Meda Pradoshaja Vyadi^[19,20]

Granthi (various cysts), *Vridhi* (herniations through various openings, scrotal enlargement), *Galaganda* (goiter, prominent neck swelling), *Arbuda* (malignant tumours), *Osta Prakopa* (disorders of lip), *Madhumeha* (diabetes), *Atisthoulya* (obesity), and *Atisweda* (excessive sweating) are the disorders related to *Meda* by *Susruths*. *Acharya Chraka* explained *Asta Ninditha Purushas* and *Poorva Roopa* of *Prameha* as *Meda Pradoshaja Vyadi*.

Adipose Tissue

Adipose tissue, also known as fat tissue or fatty tissue, is a connective tissue that is mainly composed of fat cells called adipocytes. Adipocytes are energy storing cells that contain large globules of fat known as lipid droplets surrounded by a structural network of fibres.



Adipose tissue can be found in a number of different places throughout the body. White adipose tissue is the most abundant type of fat in humans. It is distributed within subcutaneous fat, visceral fat, and bone marrow fat. Subcutaneous fat is found

throughout the whole body, in the spaces between the skin and underlying muscles. Visceral fat is predominantly found around the organs in the abdominal cavity, such as the liver, intestines and kidneys, as well as in the peritoneum (a serous membrane that lines the outside of the abdominal organs). White adipose tissue is also present in the bone marrow (a sponge-like tissue presents in the central cavity of bones). In addition, white adipose tissue can be found in the pericardium surrounding the heart, or cushioning other parts of the body, like the soles of the feet, eyeballs, and certain blood vessels. Unlike white adipose tissue, brown adipose tissue, also known as brown fat, is mostly present during fetal life and in infants. In newborns, brown adipose tissue is mainly located on the back, along the upper half of the spine, in between the shoulders, and surrounding the kidneys. With age, the amount of brown fat decreases progressively. In adults, remaining brown fat deposits can be found surrounding the vertebrae, above the clavicles, in the upper back, and in the mediastinum (the central compartment of the thoracic cavity).

In healthy adults, adipose tissue usually comprises 20–25% of the total body weight. Nonetheless, the specific body fat percentage varies considerably amongst individuals, ranging from less than 10% to over 40% of the total body weight. Increased levels of adipose tissue has been associated with several health problems, including obesity, diabetes mellitus, and heart disease, among others.^[21]

Samprapti of Sthoulya

According to *Charaka*, due to *Avarana* (obstruction) in the *Strotas* (channels) by the *Meda*,

Dosha	Kapha, Kledaka Pitta, Pachaka Vata, Samana
<i>Dushya</i>	<i>Rasa, Meda</i>
<i>Agni</i>	<i>Jatharagni, Medodhatvagni</i>
<i>Ama</i>	<i>Jatharagni Vishamata Janita, Medo Dhatvagni Mandhya Janita</i>
<i>Srotas</i>	<i>Medovaha</i>
<i>Sroto Dusti</i>	<i>Sanga</i>
<i>Udbhava</i>	<i>Amashaya</i>
<i>Prasara</i>	<i>Sarva Deha (specially where ever Medodhara kala is present)</i>
<i>Adhishtana</i>	<i>Vrukka and Vapavahana</i>
<i>Vyakta Sthana</i>	<i>Sarvanga specially Sphik, Sthana, Udara, Gala</i>
<i>Roga Marga</i>	<i>Bahya and Abhyantara</i>
<i>Vyadhi Prakara</i>	<i>Chirakari</i>
<i>Sadhya Asadhyata</i>	<i>Kruchrasadhya</i>

There is *Vridhhi* of *Koshtasthit Samana Vayu*, which in turn causes *Ati Sandhukshana* of *Jatharagni*. The increase in *Jatharagni* leads to rapid digestion of consumed food and leaves the person craving for more food. If at all due to some reason the

person Doesn't receive more food the increased *Agni* causes *Dhatu Pachana* which may lead to various complications. But because of the hunger the persons tend to eat more and the cycle continues. In this way it becomes a vicious circle creating excessive improperly formed *Medo Dhatu* with giving rise to various symptoms. Because of such condition of *Strotorodha*, the other *Dhatus* are not nourished properly causing *Shaithilya* (flabbiness) of *Dhatus* prior to *Meda Dhatu* and depletion of *Dhatus* next to *Medo Dhatus*.^[22]

DISCUSSION

The membranes in between *Dhatu (Rasa, Raktadi)* & *Ashaya* or the layers which separates the muscle tissue from cavity of organ are called *Kala*. *Ayurveda* mentioned sites for *Meda* (fat) deposition i.e., *Udar* (abdomen), yellow bone marrow in large bone, *Sarakta Meda* in *Anu Asthi* (small bones), *Vapavahan* (omentum) all these sites are equal to adipose tissue. So, fat deposited in adipose tissue called fat depots. Fat depots located in subcutaneous layer deep to skin particularly in the abdomen, greater omentum, mesentery, renal fascia. Sites of *Medo Dhatu* in female are subcutaneous fat, *Sphika* (buttocks) region, anterior aspect of thigh, in male fat tissues located more over triceps, deltoid muscle, buttocks region. So, *Medovridhi* occurs at this place. *Medodhara Kala* having property of *Meda Sanchaya* (fat deposition), according to modern science fat deposition is property of adipose tissue. So, sites & properties of *Medodhara Kala* & adipose tissue are same. Therefore, *Medodhara Kala* mentioned by *Ayurveda* may be adipose tissue according to modern science.

CONCLUSION

Fat is deposited subcutaneously and in visceral region in body considered as fat depots. *Medodhatu* is distributed all over body specifically in *Medodharakala* residing within abdomen, bone, bone marrow, nervous tissue. Concerned to *Sthoulya*, fat storing *Medodharakala* is comparable with visceral fat depots. As abdominal region consists of numerous visceral fat depots. *Udarasastha medodharakala* residing in *Vapavahana* being histologically membranous in nature, predominantly comparable with visceral abdominal omentum. Abdominal omentum can be anatomically considered as *Medodhara Kala* in *Sthoulya*.

REFERENCES

1. Yadavji Trikamji Acharya, editor. Charaka Samhita by Agnivesa with Ayurveda Dipika commentary. Varanasi: Chaukhambha Prakashan; 2010. Sutra sthana 21/2. Pg.399.

2. Sushruta Samhita, edited with Ayurveda Tatva Sandipika Hindi commentary, Shastri AD, Part I, Sutrasthan15/4 Chaukhambha Sanskrit Sansthan, Varanasi.
3. Sushruta Samhita, edited with Ayurveda Tatva Sandipika Hindi commentary, Shastri AD, Part I, Chaukhambha Sanskrit Sansthan, Varanasi, Re. Ed. 2010; Sharir Sthana 4/12, Page no. 356.
4. Yadavji Trikamji Acharya, editor. Charaka Samhita by Agnivesa with Ayurveda Dipika commentary. Varanasi: Chaukhambha Prakashan; 2010. Sutra sthana 23/3. Pg.422.
5. Vaidya Jadavji Trikamji, editor. Commentary NibandaSangraha of Dalhana on Susruta Samhita of Susruta, Shaareera sthana; Garbhavyaakarana Shaareeram: Chapter 4, Verse 6. Varanasi: Chaukambha Sanskrit sansthan, 2012; P. 355. PP 824.
6. Vaidya Jadavji Trikamji, editor. Commentary NibandaSangraha of Dalhana on Susruta Samhita of Susruta, Shaareera sthana; Garbhavyaakarana Shaareeram: Chapter 4, Verse 7. Varanasi: Chaukambha Sanskrit sansthan, 2012; P. 355.PP 824.
7. Prof. Jyotir Mitra, editor. Commentary Sasilekha Sanskrit commentary of Indu on Astanga samgraha of Vrddha Vagbhata. Shaareera sthana; Angavibhaga: Chapter 5, verse 30. Varanasi: Chowkhamba Sanskrit series office, 2016, P.302, PP.915.
8. Prof. Jyotir Mitra, editor. Commentary Sasilekha Sanskrit commentary of Indu on Astanga samgraha of Vrddha Vagbhata. Shaareera sthana; Angavibhaga: Chapter 5, verse 30. Varanasi: Chowkhamba Sanskrit series office, 2016, P.302, PP.915.
9. Dr. Anant Ram Sharma. Sushrutsamhita. Chaukhamba surbhartiprakashan varansi, Sharirsthan adhyay, 2012; 2: 4 version 8-20, 49.
10. Dr. Bhashkar Govind Ghanekar Meherchand Lacchamandas publication adhyay 4, version 11,12, 109.
11. Dr. Anant Ram Sharma. sushrutsamhita. Chaukhamba surbhartiprakashan varansi, Sharirsthan adhyay, 2012; 2: 9 version 12, 122.
12. idya jathavji trivikramji acharya, editor. Commentary Ayurveda Deepika of Chakrapani dutta, on Caraka samhitha of Agnivesa, elaborated by Caraka and Dridhabala. Chikitsa sthana; Grahanidosha Chikitsa:15/17 p.g 517.
13. Vaidya jathavji trivikramji acharya, editor. Commentary Ayurveda Deepika of Chakrapani dutta, on Caraka samhitha of Agnivesa, elaborated by Caraka and Dridhabala. vimana sthana; Srotovimana adhtyaya: chapter 5, verse 8. Varanasi: Chaukamba prakashan, 2007, P. 250. PP. 738.

14. Vaidya Jadavji Trikamji, editor. Commentary NibandaSangraha of Dalhana on Susruta Samhita of Susruta, Shaareera sthana; Dhamanee vyaakaranam shaareeram: Chapter 9, Verse 12. Varanasi: Chaukambha Sanskrit sansthan, 2012; P. 387. PP 824.
15. Prof. Jyotir Mitra, editor. Commentary Sasilekha of Indu, on Astanha sangraha of Vrddha vagbhata, shaareera sthana, chapter 6, sloka no. 26 Varanasi; chaukamba Sanskrit seies office, 2008. P. 314, PP.965.
16. Yadavji Trikamaji Acharya, Agnivesha, Charaka Samhita, with Ayurveda Dipika Commentary by Chakrapani, Chikitsasthan, 15/29-30 Chaukhamba Publication New Delhi. Reprint 2020.
17. Yadavji Trikamaji Acharya, Agnivesha, Charaka Samhita, with Ayurveda Dipika Commentary by Chakrapani, Nidansthan, 4/7 Chaukhamba Publication New Delhi. Reprint 2020.
18. Dr Brahmanand Tripathi, editor. Commentary Nirmala, on Ashtanga Hrdayam of Srimad Vagbhata. Sootra sthana; Doshaadi vijnaaneeya adhyaya, Chapter 11, Verse 10. Delhi: Chaukhamba Sanskrit Pratishthan. 2009. P.162. PP.1294.
19. Vaidya jathavji trivikramji acharya, editor. Commentary Ayurveda Deepika of Chakrapani dutta, on Caraka samhitha of Agnivesa, elaborated by Caraka and Dridhabala. Sootra sthana; Kiyantah siraseeyadhyaya: chapter 17, verse 66. Varanasi: Chaukamba prakashan, 2007, P. 103. PP. 738.
20. Vaidya Jadavji Trikamji, editor. Commentary NibandaSangraha of Dalhana on Susruta Samhita of Susruta, Sootra sthana; Vyadhisamuddeseeya adhyayam: Chapter 24, Verse 9. Varanasi: Chaukambha Sanskrit Sansthan, 2012; P. 70. PP 82.
21. osmosis
22. Yadavji Trikamaji Acharya, Agnivesha, Charaka Samhita, with Ayurveda Dipika Commentary by Chakrapani, Sutra sthana, 21th chapter, verse no. 5-8, Chaukhamba Publication New Delhi. Reprint 2020, Page number-116.