WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 13, Issue 22, 134-143. Review Article ISSN 2277–7105

A COMPARATIVE REVIEW OF AYURVEDA AND MODERN PERSPECTIVE ON MEDA DHATU AND STHAULYA

Pallavi Sudam Khandagale[1]* and Prajkta Kulkarni[2]

[1]PG 3rd Year, Department of Rachana Sharir, Tilak Ayurveda Mahavidyalaya, Rasta Peth, Pune- 11 Maharashtra State, India.

[2]M.D. Rachana Sharir, Assistant Professor, Rachana Sharir Department, Tilak Ayurveda Mahavidyalaya, Rasta Peth, Pune- 11 Maharashtra State, India.

Article Received on
02 October 2024,

Revised on 22 October 2024,
Accepted on 12 Nov. 2024

DOI: 10.20959/wjpr202422-34394

***Corresponding Author**
Dr. Pallavi Sudam Khandagale
PG 3rd Year, Department of Rachana Sharir, Tilak Ayurveda Mahavidyalaya, Rasta Peth, Pune- 11 Maharashtra State, India.

ABSTRACT

Ayurveda is a traditional medicinal system that emphasizes the significance of *Tri Dosha* (Three bodily humors), Sapta Dhatu (Seven tissue elements), and *Tri Mala* (Three waste products) as foundational elements for bodily health and balance. The interplay of *Sarira* (Body), *Manas* (Mind), and *Prana* (Life force) is intricately supported by these *Dhatus*, with all seven playing a crucial role in nourishing the body throughout life. *Meda Dhatu*, which represents adipose tissue and is the fourth among the seven *Dhatus*, provides essential lubrication (*Snehana*) to the body. The formation of Dhatu, along with its associated *Upadhatu* and *Mala*, is significantly influenced by *Dhatvagni*, specifically the *Medo Dhatvagni* responsible for *Meda Dhatu* synthesis. During the generation of *Meda Dhatu*, two types emerge this are: *Poshya Meda Dhatu*, which nourishes the *Meda Dhatu*, and *Poshaka Meda Dhatu*, which contributes to the development of *Asthi Dhatu* (bone tissue). Any dysfunction in the *Medovaha Srotas* (channels that transport *Meda Dhatu*) can lead to improper *Meda Dhatu* formation, resulting in *Meda Pradoshaj Vikaras* (fat-related diseases). This review critically evaluates existing literature to assess the concept of *Meda Dhatu* and *Sthoulya* in *Ayurveda*.

KEYWORDS: Ayurveda, Dhatu, Meda Dhatu, Medodhatu vikriti, sthoulya, obesity.

INTRODUCTION

Body is made up of tissues that is termed as Dhatu in Ayurveda. According to various Acharyas Dosha, Dhatu and Mala are the fundamental and the three pillars of our body.[1] Ayurveda has described seven dhatus that are produced in kind of progressive metamorphosis beginning with rasa dhatu (Primary product of digested food), followed by rakta dhatu (Blood tissue), mamsa dhatu (Muscle tissue), meda dhatu (Fat tissue), asthi dhatu (Bonetissue), majja dhatu (Bone marrow) and ending with final product shukra dhatu (Reproductive flued).[2] The previous dhatu form and nourishes the next dhatu, here they act as substratum for each other.

शरिर धारनात् धात्वाः। आ.ह्र.सु.1/13 टीका.

The elements that support the body are known as dhatus. These dhatus must remain in proper balance within the body for it to function optimally. Any imbalance can lead to ailments and diseases.[3] Meda dhatu plays a crucial role in the body's metabolic processes. It nourishes the body by storing and supplying energy, helps regulate body temperature, and supports the lubrication of joints and tissues.[4]

Aim

To study the concept of "*Meda Dhatu*" described in Ayurveda.

Objective

To review *"Meda Dhatu"* in detail from different ayurvedic literature.

MATERIAL AND METHODS

All available literature for the conceptual study of *Meda Dhatu*, consept of sthoulya and obesity e.g. *Samhita's,* all available commentaries and other text books of *Ayurveda*, journals, research papers, articles, academic databases, authenticated internet sources etc. are used to understanding of the concept under the study.

Literature review

Medas shabda yutpatti: *The word* medas *means "fat" or "greasy substance. It refers to excess body fat or obesity.*

Meda dhatu yutpatti: *The term* "Meda" *is derived from the root* "Jimida Snehne," *which relates to concepts like fat, oil, and moisture (*Vachaspatyam*). It refers to substances characterized by the quality of being*"Snigdha," *or unctuous.*

Synonyms of *meda dhatu:* *Vapa, Vasa, Mamsaja, Mamsateja, Asthikrit, ojas.*[5]

Formation of meda dhatu: Meda Dhatu is produced from Ahara Rasa after the formation of Mamsa Dhatu, the Mamsa Dhatwagni (The tissue fire of muscle tissue) acts on Poshaka Mamsa (Nutrients from muscle tissue that contribute to fat formation) Meda Dhatu is formed. When this newly formed Meda Dhatu undergoes further metabolism by Meda Dhatwagni, leading to the creation of Poshya Meda Dhatu, which nourishes the local fat tissue. The remaining portion transforms into Poshaka Meda Dhatu, which subsequently gives rise to Asthi Dhatu.[6]

Dalhana describes the three-level metabolism (Tridha Poshana) of Meda Dhatu, where Meda Dhatvagni acts on its nutrients to synthesize three main constituents:Sthula Meda Dhatu, Meda Mala (Sweda), Sukshma Bhaga of Asthi.[7]

Updhatu of meda dhatu: According to Acharya Sushruta, Meda Dhatu forms over 15 days. Initially, Mamsa Dhatu is nourished, followed by the nourishment of Meda Dhatu through Ahara Rasa, aided by Meda Dhatwagni and Medovaha Srotas. This process results in the formation of Poshya Meda, Poshak Asthi, and Updhatu, such as Snayu (ligaments) and Sira (veins).[8]

Mala* of *meda dhatu - *Sweda* is the *Mala* (waste) of the meda dhatu.[9]

***Panchbhautika swaroopa* of *meda dhatu*:** *Meda Dhatu* is classified as a *Sneha* dominant *Drava*. It primarily exhibits the dominance of the *Prithvi* and *Apā Mahabhutas*.[10]

Qualities of *meda dhatu*: *Guru* (Heavy), *Snigdha* (Unctuous), *Sthira* (Stable), and *Mrudu* (Soft). Consuming food that shares similar qualities (*Gunas*) with *Meda Dhatu* can enhance its presence in the body (*Vruddhi*).[11]

Functions of medo dhatu

1. *Snehana* (Oiliness): The oily quality of *Meda* maintains the luster of the skin, hair, and eyes. An increased *Snehana* function can lead to conditions like *Medoroga*, characterized byenhanced oiliness.
2. *Sweda* (Perspiration): Meda plays a role in producing *Sweda*, which is considered a waste product (*Mala*) of this tissue.
3. *Asthi Pushti* (Bone Nourishment): *Meda* is essential for nourishing *Asthi Dhatu* and its

derivatives, such as *Snayu* (tendons) and *Sandhi* (joints).

4. *Dridhatva* (Consistency): The consistency of the body is supported by *Snayu*, which is linked to *Asthi Dhatu. Meda* contributes to the structural integrity of various organs by forming a protective layer that cushions them from external pressures and friction. It also acts as an energy reserve, providing nearly double the energy compared to other nutrients like carbohydrates and proteins.
5. *Netra* and *Gatra Snigdhata* (Oiliness in the Body): Increased oiliness in the eyes and body may indicate *Sthaulya* (obesity), stemming from an enhanced *Snehana* function of *Meda.*

Types of meda dhatu

According to *Ayurvedic* classics, *Meda* (fat) can be classified into two types:

1. ***Baddha Meda* (Bounded/Immovable):** This type is characterized by its immobile nature *(Gativivarjita*) and is stored in the *Medodhara Kala*, located in the *Udara* (abdomen) and *Anu Asth*i (Small bones). Other depots for *Poshya Meda* include the *Udara*, *Sphika* (hips), Stana (Breasts), and *Gala* (Throat).[12]

2. ***Abaddha Meda* (Unbounded/Movable):** As per *Acharya Charaka*, *Bahudrava Shleshma* (*Kapha* with excessive liquidity) can influence *Meda*, rendering it *Abaddha* (unbounded) in nature. This type is mobile (*Gatiyukta*) and circulates throughout the body with *Rasa* and *Rakta Dhatu*, providing nutrition to *Poshya Meda Dhatu*. Imaging techniques have shown that lipids, including cholesterol, circulate in the blood, serving as examples of *Abaddha Meda.*[13]

3. **Medo pradoshaja vikara:** The initial symptoms of *Prameha* include conditions like *Jatilibhava* (Hair disorders), *Mukha Madhurya* (Sweetness in the mouth), and sensations of numbness and burning in the hands and feet. Disorders associated with the dysfunction of Meda Dhatu include *Granthi*, *Medovriddhi*, *Galganda*, *Arbuda*, *Medojanya Osthaprakopa*,*Madumeha*, *Atisthaulya*, and *Atisweda.*[14]

Medovaha Srotas enable the circulation of Poshaka or Asthayi Meda Dhatu throughout the body, mixed with Rasa and Rakta, thus nourishing the Sthayi Meda Dhatu. Disruption of these channels is associated with conditions like Medodushti or Medoroga.

Symptoms of meda kshaya

According to Achyarya Sushrut - When Meda Dhatu is deficient, symptoms manifest as crepitations in the joints, weakness in the five sense organs, easy fatigability, a sunken abdomen, splenomegaly, dryness, and a preference for fatty foods.[15]

According to Achyarya Charak -cracking of joints, lassitude of eyes, exhaustion and thinness of abdomen.[16]

Acharya Vagbhata states that a reduction in Medas (Fat tissue) leads to symptoms such as loss of sensation in the waist region (Katiswapa), enlargement of the spleen (Pleeha Vruddhi or Splenomegaly), and an emaciated, thin appearance (Krishangata).[17]

Medo vruddhi: Meda Dhatu exists in two within the body. It included being Guru (Heavy), Snigdha (Unctuous), Sthira (Stable), and Mrudu (Soft). Consuming food that shares similar qualities (Gunas) with Meda Dhatu can enhance its presence in the body (Vruddhi).[18]

Acharya Vagbhata explains that an increase in Meda (Fat tissue) results in symptoms like fatigue, rapid breathing after minimal exertion, and sagging of the buttocks, breasts, and abdomen. Consuming Meda Vruddhikara Ahara promotes the growth of Meda Dhatu, while excessive intake can lead to an increase in fat deposits in areas such as the hips, breasts, abdomen, and may result in increased respiration after physical exertion. On the other hand, a deficiency in Meda Dhatu can cause conditions like Kati Svapan (Loss of sensation in the waist), Pliha Vruddhi (Splenomegaly), and Krush Anga (Weight loss). The fat located in the omentum and peritoneum is termed Vapa, while the fat found within Mamsa Dhatu is referred to as Vasa.[19]

Sthoulya

Sthoulya is a condition characterized by an increase in Meda and Mamsa Dhatu, leading to flabbiness and a pendulous appearance in the Udar (Abdomen), Spik (Buttocks), Sthana (Breasts). This improper formation of the medodhatu causes Uthsahahani in individuals.[20]

Pathophysiology of sthoulya according to acharya charaka: Describes the with a focus on Medasavruta Vata, where certain factors (Nidana) elevate Medas at the expense of other Dhatus in susceptible individuals. This results in Vata becoming confined to the Koshta due to the obstruction caused by Medas, which accelerates digestion. A disturbance in Agni leads to the production of Ama, affecting the Dhatvagni of Meda Dhatu and hindering the proper

formation of other Dhatus. Improperly formed Meda Dhatu accumulates in the body, resulting in obesity. This fat accumulation disrupts Vata's movement, increasing appetite and leading to excessive food consumption, which transforms into unsuitable fatty tissue, creating a vicious cycle.[21]

The pathophysiology of sthoulya according to acharya sushruta: Is interpreted somewhat differently in Sushruta Samhita. Here, indulgence in Nidana leads to the production of Anna Rasa, primarily sweet in nature. The transformation of Dhatu (Dhatu Parinama) is impeded by excessive Sneha and Meda due to Dhatwagnimandya, contributing to Sthoulya. The formation of Ama also plays a crucial role in its pathogenesis, where Dhatwagnimandya and Adhyashana are primary causes of Ama production. This condition results in the accumulation of Ama and Meda Dhatu at the expense of Rakta and Mamsa Dhatu. The Amarasa formed due to Rasadhatwagnimandya remains in the Ama state during the Dhatu Poshana process. Factors such as consuming Vishista Ahara, a sedentary lifestyle, and stress trigger the development of Sthoulya. The production of Anna Rasa, primarily observed in Amavastha, combines with Sleshma due to the intake of heavy foods. In Sthoulya, Meda Dhatu increases disproportionately compared to other Dhatus in the Dhatu Pariposhana process due to specific factors favoring Meda Vridhi. Engaging in Nidanas like lack of exercise, heavy foods, and daytime sleeping leads to the creation of Anna Rasa, dominated by sweet flavors, which enhances the body's Sneha Guna and Meda Dhatu. Margavarodha, caused by the excessive production of Meda Dhatu, results in the depletion of other Dhatus and manifests as symptoms such as thirst and minor respiratory issues.[22]

Ashtanga Sangraha- The consumption of causative factors (Nidana), such as heavy or rich foods (Guru Ahara), leads to the production of improperly digested food essence (Anna Rasa) that remains in an undigested state (Amavastha). This undigested essence combines with Sleshma (Kapha) and becomes concealed or adheres to the Dhatus (tissues). This process weakens (Shlatheekarana) the Dhatus, ultimately leading to the development of Sthoulya (obesity).[23]

According to madhava nidana: obesity can lead to Ama due to rapid eating.

The development of Sthoulya described in texts like Bhavaprakasha, Yogaratnakara, Sharangadhara, Basavarajeeyam, and Vangasena aligns with the descriptions found in Madhavanidana.

Vagbhata categorizes sthoulya into three types

1. Adhik Sthoulya: Associated with other complications.
2. Madhyam Sthoulya: Exhibits moderate symptoms.
3. Hina Sthoulya: Presents minor symptoms of obesity without severe complications.

Management of sthoulya: Ruksha and Tikshna treatments, Panchakarma like- virechana, udvartana, basti. Medications including Arogyavardhini Vati, Triphala, Vidanga, Pippali, Trikatu, Vidangadi Churna, and Takrarishta, medohar guggul, medopachak vati, Dravya from lekhaniya gana likes haritaki (terminalia chebula), vidang (embelia ribes) etc. These therapies provide Medovinasini properties, enhance digestive strength, facilitate ama pachana, balance Tridosha, clear bodily channels, regulate metabolic activities, adjust hormonal balances, decrease fat deposition, and alleviate mental stress, thus offering both pathological and symptomatic relief in Sthoulya. A balanced diet, regular exercise, Yoga, laghu ruksh aahar.[24]

Causes of obesity according to modern science: Psychological factors, Consumption of fast foods and high-fat foods, Hormonal changes, including menopausal symptoms in females, Certain medications.

Symptoms of obesity from a modern perspective: Laziness and difficulty walking, lack of enthusiasm and excessive sweating, Loss of libido and breathlessness, Inappropriate body frame, difficulty doing physical activity, low confidance and self - esteem.

Obesity is commonly assessed using several parameters, including

1. The Body Mass Index (BMI), calculated by dividing weight in kilograms by height in meters squared (kg/m^2), is the most common method for assessing obesity. A BMI between 25.0 and 29.9 falls under class 1 obesity. (Reference: API Textbook of Medicine, Volume 2, 9th edition).
2. Percent Body Fat: In females, the typical body fat percentage ranges from 18% to 22%, but in cases of obesity, it can increase to as much as 33%.
3. Skin fold Measurements: This method uses calipers to measure skinfold thickness at four specific locations:

a) Biceps: The measurement is taken at the center of the biceps while the arm is straightened.
b) Triceps: Measured at the back of the upper arm.
c) Suprailiac: Taken about 1 inch above the hip joint.

d) Subscapular: Measured just below the scapula (shoulder blade) on the back. The values from these four sites are combined, and an average is calculated. This average can then be compared to standard charts to assess normal bodyfat levels.

4. Waist-to-hip ratio: This measurement should be less than 0.85 for optimal health. These parameters can provide a more comprehensive assessment of obesity and associated health risks.

CONCLUSION

Today's unhealthy lifestyle is often characterized by a combination of sedentary habits, poor diet, and high levels of stress. Many people spend long hours sitting at desks or in front of screens, which reduces physical activity and contributes to various health issues. Diets can be high in processed foods, sugars, and unhealthy fats, while fresh fruits, vegetables, and whole grains may be under consumed. Stress from work, social pressures, and other sources can also impact mental and physical health. These factors are responsible for the *meda dhatu dushti*. To maintain balance in *Meda Dhatu, Ayurveda* recommends a balanced diet, regular exercise, and appropriate lifestyle practices. Herbs and treatments may also be used to support healthy fat metabolism and overall well-being.

Understanding *Meda Dhatu* helps in managing health and preventing diseases related to metabolic and digestive functions.

REFERENCES

1. Sushruta Samhita, edited with Ayurveda Tatva Sandipika hindi commentary, Shastri AD, Chaukhambha Sanskrit Sansthan, Varanasi, Re. Ed, 2018; 15: 73-3.
2. Caraka Samhita, Chikitsa Sthana, Grahni dosha chikitsam, 15-16. Available from: https://niimh.nic.in/ebooks/ecaraka.
3. AstangaHridayam of Srimadavagbhata with Nirmala Hindi commentary by Dr. BrahmanandTripathi, Reprinted, Chaukhamba Sanskrit Pratishthan, Delhi, Sutra Sthana, Chapter, 2017; 1: 13-11.
4. Charak Samhita of Agnivesha revised by Charaka and Dridhabala, Edited by Dr Gangasahaya Pandeya forwarded by Vaidya Yadavji Trikamji Acharya, Sharira sthan Sharirasankhya Adhyaya, Shloka no published by Chaukhamba Sanskrita Sansthana Varanasi, Reprint, 2011; 7: 15-810.
5. Agnivesh: Caraka Samhita Part II with Satyanarayan Shastri, Elaborated Vidyotini Hindi Commentary by Kashinath Shastri, Gorakhnath Chaturvedi, Chaukhamba Bharati

Academy Varanasi. Chikitsa Sthana, 2006; 458: 15-30.

6. Acharya Charaka, Ayurved Dipika Commentary of Chakrapani, Sutrastahana Edited By Dr.Jadavji Trikamji Achraya, Charak Samhita Th Edition, Varanasi, Cahukamba Surbharti Prakashana, 1995; 28, 4: 174-3.
7. Sushruta Samhita of Maharshi Sushruta with Nibandh Sangraha of Dalhanacharya and Nyayachandrika of Gayadasacharya, by Dr. Keval Krushna Thakaral, Part, Reprint, Chaukhambha Orientalia, Varanasi, SariraSthana, Chapter, 2017; 2, 4: 29-57.
8. Acharya Charaka, Ayurved Dipika Commentary of Chakrapani, Sutrastahana Edited By Dr.Jadavji Trikamji Achraya, Charak Samhita, Varanasi, Cahukamba Surbharti Prakashana, 1995; 28, 4: 174-3.
9. Caraka Samhita, Chikitsa Sthana, Grahni dosha chikitsam, 15, 17. Available from: https:// niimh.nic. in/ebooks/ecaraka.
10. Caraka Samhita, Chikitsa Sthana, Grahnidosha chikitsam, 15, 18. Available from: https:// niimh.nic. in/ebooks/ecaraka.
11. Sushruta Samhita, Sharira Sthana, Garbhavyakarana, 04-05. Available from: https:// niimh.nic.in/ebooks/ esushruta.
12. Subhash Ranade. A text book of Sharira Kriya Vijnan, Chaukamba sanskrit pratishtan, Delhi, 191: 2-3.
13. Ibid, Charaka Samhita, Sharir Sthana, I, 915: 7-15.
14. Ibid, Charaka Samhita, Chikitsa Sthana, II, 456: 15-17.
15. Caraka Samhita, Chikitsa Sthana, Grahni dosha chikitsam, 15, 03-04. Available from: https:// niimh.nic.in/ebooks/ecaraka.
16. R Vidyanath. Caraka Samhita, Chaukhambha prakashak, Varanasi, 1, 1: 7, 66: 535.
17. KR Srikantha Murthy. Susruta Samhita, Chawkhamba Orientalia, Varanasi, 1, 2: 15, 9: 100.
18. KR Srikantha Murthy. Vagbhatas Astanga Hrudayam, Chawkhamba krishnadas academy, Varanasi, 11, 18: 159.
19. KR Srikantha Murthy. Susruta Samhita, Chawkhamba Orientalia, Varanasi, 1, 2, 15, 14: 102.
20. KR Srikantha Murthy. Vagbhatas Astanga Hrudayam, Chawkhamba krishnadas academy, Varanasi, 11, 10: 157.
21. Acharya Yadavji Trikamji. Charaka Samhita of Agnivesha, Krishnadas Academy, Varanasi, 117.
22. Acharya Yadavji Trikamji. Charaka Samhita of Agnivesha, Krishnadas Academy,

Varanasi, 116.

23. Acharya Yadavji Trikamji. N.R Sushruta Samhita of Sushruta, Chowkamba Orientalia, Varanasi, 7: 73.
24. Jyotimitra. Ashtanga Sangraha of Vriddha Vagbhata, Chaukhamba Sanskrit series, Varanasi, 2: 184.
25. Upadhyaya Y. Madhavanidanam, Uttararda, Chaukhamba SanskritSamsthan, Varanasi, 2, 27: 28.
26. Mishra BS. Bhavaprakasha, Chaukhamba Sanskrit Samsthan, Varanasi, 405: 2-7.