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THE CONCEPT OF OBESITY – A COMPREHENSIVE REVIEW

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ABSTRACT

The WHO has declared that obesity is the major health care challenge in developing centuries as its prevalence has increased globally. Obesity occurs when caloric intake exceeds than expenditure, but a growing body of evidence supports the view that obesity is caused by inherited tendencies to subtle disorder of the weight regularity mechanism magnified by a poor diet and lack of physical activity practiced by most of the population. This article revolves around the details of Obesity described in various texts of Ayurveda. An attempt has been made to understand Obesity through Ayurvedic perspective as well as Modern view and to find out the likely solutions for obesity through Ayurveda. Obesity has been described as *Sthaulya* or *Medoroga* in Ayurvedic texts. In this article definition, prevalence, etio pathogenesis, treatment of obesity will be described.

KEYWORDS: Ayurveda, Obesity, Sthaulya.

INTRODUCTION

Over weight and obesity pose a major public health challenge worldwide. Obesity is a chronic condition that develops as a result of an interaction between a person's genetic makeup and environmental factor that are not well understood. These environmental factors include social, behavioral, cultural, psychological and metabolic aspects contributing to development of obesity. It has been noticed that there is tremendous increase in prevalence of obesity particularly in urban population in comparison to tribal and rural people due to

various socio-economic factors. The rate of development of obesity is increasing dramatically in the recent past years due to economic, social and technological advances that have contribute to unhealthy dietary habits and sedentary behavior during the past several years. It has been reported that Obesity is the second leading cause of mortality in US where approximately 3,00,000 deaths occur per year.[1] However obesity is the condition which is modifiable and preventable by following various pharmacologic and non-pharmacologic methods, thus the morbidity as mortality can also be prevented or at least minimized, to a significant extent.

MATERIALS AND METHODS

The Literary material related to obesity has been collected from Several Ayurvedic texts like Charakasamhita, Sushrutsamhita, Ashtanga Sangraham, Ashtanga Hridayam and recent published studies by the internet.

DEFINITION

The word *Obesity* originated from the Latin word "*obēsus*" meaning "stout, fat, or plump. The word "*Ēsus"* signifies "to eat". The Synonyms of Obesity are overweight, adiposity, fattiness, stoutness, plumpness etc.[2] Obesity may be defined as an abnormal growth of the adipose tissue due to an enlargement of fat cell size (hypertrophic obesity) or an increase in fat cell number (hyperplastic obesity) or a combination of both.[3] Maharshi Charaka was the first person to give the appropriate and precise definition of Sthaulya.

Medomääsätivåddhatväccalasphigudarastanaù
ayathopacayotsäho naro'tisthüla ucyate||

1. Excessive adipose tissue deposition in the body is known as Obesity.
2. If the body weight is more than 20% of ideal body weight, we concerned the patient as obese.
3. A better index of Obesity is the Body Mass Index (BMI). Few year back National Institute of Health Consensus conference defined Obesity as BMI greater than 27kg./m2. But now a day Obesity is defined as BMI $\geq$ 25kg/m2.[4]

Prevalence of obesity in India

Obesity has reached epidemic proportions in India in the 21st century, with morbid obesity affecting 5% of the country's population. India is following a trend of other developing countries that are steadily becoming more obese. The rise in obesity is likely multifactorial.

Although there is certainly a genetic predisposition to obesity, several environmental factors are also implicated, including excess portion size, dietary macronutrient composition and sedentary lifestyle in the setting of modern-day conveniences. Unhealthy, processed food has become much more accessible following India's continued integration in global food markets. This, combined with rising middle class incomes, is increasing the average caloric intake per individual among the middle class and above income households.[5] Before the 20th century, obesity was rare; in 1997 the WHO formally recognized obesity as a global epidemic. As of 2005 the WHO estimates that at least 400 million adults (9.8%) are obese, with higher rates among women than men.[6]

Etio-pathogenesis of obesity

The etiology of obesity is multifactorial, involving a complex interaction among genetics, hormones and the environment. Though multiple candidate genes have been implicated in the pathogenesis of obesity, these findings are inconsistent.[7,8] These genes include the beta-3-adrenergic receptor gene, peroxisome-proliferator-activated receptor gamma 2 genes, chromosome 10p, melanocortin-4 receptor gene and other genetic polymorphisms. Multiple hormones are involved in the regulation and pathophysiology of obesity, including gut-related hormones, adipocytes and others. Ghrelin is a circulating peptide hormone derived from the stomach. It is the only known peripherally acting orexigenic hormone and is responsible for stimulating appetite.[9] In a double-blind cross-over study, intravenous ghrelin infusion into healthy volunteers led to a 30% increase in food intake at a buffet, with no change in gastric emptying.[10] All other gut-derived hormones serve as anorectic agents that are responsible for limiting food intake to achieve optimal digestion and absorption while avoiding the consequences of overfeeding, such as hyperinsulinemia and insulin resistance. These anorectic gut hormones are discussed below. Peptide YY (PYY) is found throughout the intestine at progressively higher levels distally, with the highest levels in the colon and rectum. It is secreted by the L cells of the distal small bowel and colon. PYY is released postprandial, and signals to the hypothalamus, resulting in delayed gastric emptying, thus reducing gastric secretion. Administration of PYY before meals results in decreased food consumption.[11]

ETIOLOGY (NIDANA) OF STHAULYA IN AYURVEDIC CLASSICS

All the causative factors described in *Ayurvedic* classics can be classified into four[12] groups.

1. Aharatmaka Nidana

2. Viharatmaka Nidana
3. Manas Nidana
4. Beejadosha

AHARATMAKA HETU (Dietetic factors)

Navannasevana (Uses of fresh grains), *Nava Madhya Sevana* (Uses of fresh alcoholic preparation), *GramyaRasasevana* (Uses of domestic animal's meat & soups), *Audak Rasa sevana* (Uses of Aquatic animal's meat & soups), *Atisampurana*(Over eating), *Santarpana, Adhyasana, Guru Aharasevana* (Excessive consumption of sweet food), *Madhura Aharasevana* (Excessive consumption of sweet food), *Sheeta Aharasevana* (Excessive consumption of cold diet), *Snigdha Aharasevana* (Excessive consumption of unctuous food), *Sleshmala Aharasevana* (Kapha increasing food), *Mamsa Sevana* (Excessive use of meat), *Paya Vikar Sevana* (Excessive uses of milk and it's preparations), Dadhi Sevana (Excessive uses of curd).

VIHARATMAKA HETU

Avyavaya (Lack of sexual life), *Divaswapna* (Day's sleep), *Asana Sukha* (Luxurious sitting), *Swapnaprasangat*(Excessive sleep),*GandhamalaSevana*(Using of perfumes garlands), *BhojanotarSnana (*Bathing after taking the meals).

MANSIKA HETU (PSYCHOLOGICAL FACTORS)

Harashnityatvat (Uninterpted cheerfulness), *Achintana* (lack of anxiety), *Priyadarshana* (Observations of beloved things), *Manasonivritti* (Relaxation from tension).

BEEJA DOSHA

Charaka has described a specific cause *Beejadoshswabhava* for *Sthaulya*, it means *Sthaulya* may developed by abnormalities of *Beej*. *Acharya Vagbhata* have described the *Sahaja Sthaulya* due to dietary fault of pregnant lady. So two miscellaneous causative factors of of *Sthaulya* have been described in *Ayurvedic* text .i.e .*Beejadoshajanya , Garbhajvyadhi*.

PURVARUPA

Purvarupa of *Sthaulya* has not been described by any *Ayurvedic* texts. According to *Charaka*, the *MedovahasrotodushtiLakshanas*, which are also mentioned as *Purvarupa* of *Prameha*[13]can be considered as *Purvarupa* of *Sthaulya*. Again, there is similarity in pathogenesis of *Prameha* and *Sthaulya*. *Bahudrava Shleshma* and *Abaddha Meda* are the two

morbid components involved in pathogenesis of *Prameha*.[12] *Kapha* and *Meda* also gets vitiated in *Sthaulya*. Therefore, *Purvarupa* of *Prameha* and *Medovaha Srotodushti Lakshanas* can be considered as *Purvarupa* of *Sthaulya*. The symptoms related with *MedaDushti* like *Atinidra, Tandra, Alasya, Visra Shariragandha, Angagaurava, Shaithilya* etc. can be considered as *Purvarupa* of *Sthaulya*.

RUPA

Charaka[15] has narrated *Pratyamlakshana (Rupa)* of *Sthaulya* as *Medomamsa Ativriddhi, ChalaSphik, Chala Udara, Chala Stana, Ayatha Upachya, Anutsaha* etc.

Beside these Cardinal Symptoms, eight disabilities of *Sthaulya* are as follows.

1. *Ayushohrasa* (Diminution of life span)
2. *Javoparodha* (Lack of enthusiasm)
3. *KricchraVyavaya* (Difficulty in sexual act)
4. *Daurbalya* (Debility)
5. *Daurgandhya* (Foul smelling of body)
6. *Swedabadha*(Distressful sweating)
7. *Kshudhatimatrata* (Excessive hunger)
8. *PipasaAtiyoga* (Excessive thirst)

Elaborated pathogenesis of occurrence of Ashta Dosaof Sthaulya has been mentioned in Caraka Samhita, which are as follows.

- Due to excessive formation of *Medodhatu*, formation of other *Dhatu* is inhibited. So due to lack of nourishment it causes *Ayushohrasa*.
- Due to *Shaithilya, Saukumarya* and *Guru* properties of *Medodhatu*, it causes *Javoparodha*.
- Due to obstruction in genital passage by *Medo Dhatu* and paucity of semen it results in *Kricchravyavaya*.
- Owing to imbalance of *Sapta Dhatu* produced by *Sanga* type of obstruction of *Medasdhatu*, it results in general debility (*Daurbalya*).
- Due to excessive sweating, innate quality of *Medo Dhatu* and morbid nature of vitiated *Meda* ,it cáuses *Daurgandhya.*
- By the admixture of *Kapha* with *Meda*, *Vishyandi, Bahutva* and *Guru* properties of *Meda* and its inability to bear the strain of exercise, it results in *Swedabaddha*.

Due to increase *Agni* in *Kostha* and vitiation of *Vata* by obstruction of *Meda,* it results in *Kshudha Atimatrata*and *Pipasaatiyoga.*[14]

It indicates the clear involvement of *Medovaha Srotas* along with *Rasavaha Srotas. Ati Sweda* and *Daurgandhya* indicate the involvement of *Swedavaha Srotas*. Presence of *Atipipasa* indicates the involvement of *Udakavaha Srotasa*. In the pathogenesis of *Sthaulya*, increased fat deposition inside the muscle (*Vasa*) indicates the involvement of *Mamsavaha Srotas*.[17]

Upadrava (complications) of Sthaulya

Apach, Arsh, Atisar, Bhagandara, Jwara, Kamla,Visharp, Prameha, Shlipada.[18]

Complications which are Described in Modern Science

Diabetes, Heart Diseases, Arthritis, Cancer, Hypertension, Gall stones, Sleep disorders, Piles etc.

CLASSIFICATION OF OBESITY

- *HinaSthaulya (BMI 25-30- kg/m2)* –Overweight
- *MadhyamaSthaulya (BMI 30-40 kg./m2)* –Obese grade class I &II
- *AdhikaSthaulya (BMI > 40 kg/m2)* –Morbid Obese class III

GENERAL PRINCIPLES FOR THE TREATMENT OF STHAULYA -

In texts, the principles of management of Sthaulya, Kaphahara Medohara, Vatahara drugs are advised by various acharyas.

Most of the drugs which have mentioned for Sthaulya, have Katu, Tiktha and Kashayarasas. These rasas have the tendency of reducing Kapha and Medas. Katu rasa removes the obstruction and normalizes the blood flow Srotovivarana, Kaphahara.[19]Tiktha and Kashayarasas have Lekhanaguna[20] that scraps out excessive Kapha and Meda from srotas.

In addition to Lekhana, Kashaya rasa also has the property of Shoshana, which absorbs the excessive fluids and lipid substances caused by hypercholesterolaemia. So, it is apparent that by virtue of Rasas, these drugs acts as Kapha, Medohara.

Review of Panchakarma treatment for disease Sthaulya

Higher exclamation of Samshodhana therapy, Purvakarma like snehana, Svedana and PradhanaKarm including Vamana, Virechana etc. have been contraindicated for Atisthula patient by most of the Ayurvedic texts.[22] But Charaka has mentioned Sthaulya under the caption of SantarpanajanitaVyadhi and for its management Virechana and Raktamokshana are recommended.[23] He also suggested Ruksha, Tikshna and UshnaBasti for the management purpose of Sthaulya.[24]

General Principles of Panchakarma therapy

Management of any disease is divided into 3 parts.[25]

1. Nidana Parivarjana, 2. Samshodhana, 3. Samshamana

Nidana parivarjana

It has been stated in Ayurveda first remedy is to avoid the causative factors which is preventive measure of the disease the sthaulata is related excessive diet etc. day sleep and avoidance of intercourse are the causative major factors of sthaulata. For prevention of sthaulata the following are the prescriptions per excellence.

- Administration of shilajatu, honey, takrarista, vidanga, juice of agniamanth, amalaki, haritaki, musta.
- Diets and drink that alleviate vata and kapha and which can reduce fats.
- Unction with unctuous drugs.

Exercise has been regarded as preventive measure of sthaulata. Rasayandravya may be taken as a preventive measure for a particular disease.

SAMSHODHANA

Panchakarma has its unique technique to make the body for main treatment samshodhana therapy patient should have to undergo Poorvakarma like snehana, Svedana and PradhanaKarm including Vamana, Virechana etc.

SAMSHAMANA THERAPY

Among Shadupakrma, Langhana and Rukshana can be peformed for Samshamana Purpose in Sthaulya.[26] ShamanaChikitsa can be implemented through seven different ways. Deepana, Marutsevana, Kshudha Nigraha, Pachana, Atapasevana, Trushna Nigraha, Vyayama. All these seven procedures can be counted under single title i.e. "ShamanaLanghanaChikitsa".

Langhana is advisable in SantarpanajanyaVyadhi, in AmashyothaVikara, in ShleshmikaVikara, in RasajaVikara and it is the best remedy for the Sama condition of disease. So, all seven types of Langhana can be applied for the patients of Sthaulya according to Rogi-RogaBala.

Charaka Samhita has been given treatment in following words.

Administration of Guru and Apatarpaka articles which possess additional Vata, Shleshman and Medonashaka properties is considered as an ideal for Shanshamana therapy. Chakrapani has explained that Guru Guna is sufficient to alleviate vitiated Agni and Atikshudha. Apatarpana property provides less nourishment and thus leads to depletion of Meda. For example Madhu possess Guru and Ruksha properties, hence it is ideal for management of Sthaulya.

DISCUSSION

Charakahas given detail description of causative factors, etiopathogenesis, sign and symptoms of Obesity. Acharya Susruta has added the complications of the disease & given importance to avoid causative factors of the disease *Nidana* of *Sthaulya* is divided in four categories *Aharatmaka*, *Viharatmaka*, *Manasa* and *Anya*. Besides these *Nidanas*, nowadays it is seen that due highly refined food with maximum percentages of carbohydrates & high-tech machineries which makes a person less active & prone to Obesity. Hereditary factor is also coming up as the prominent cause for Obesity.

CONCLUSION

- Charaka has mentioned *Sthaulya* (Obesity) under the caption of *Santarpanottha Vikara* and it should be treated with *Apatarpan* (Reducing Therapy).
- *Nidanas* of *Sthaulya*, mentioned in classics are now changing. Increasing stress, faulty dietary habits and decreased awareness regarding exercise are becoming the prominent causative factors.
- In Society, Percentage of population suffering from *Sthaulya*is increasing day by day so they should made aware regarding the disease and its severe complications before it reaches to its epidemic level.
- It is clear that reducing overall energy intake is key to losing weight. Increasing physical activity can also be helpful alongside calorie reduction in achieving weight loss and sustaining a healthy body weight, as well as improving overall health.

- Prevention is the most important key factor for this disease. Patients should be educated to follow the life style changes recommended by Ayurveda.

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