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Exploring the Impact of *Ayurvedic* approaches on Obesity: A Scientific Research Perspective

Naresh Itani¹, Yogesh², Komal Keshwa³, Divya Pathak⁴, B.K. Sevatkar⁵

^{1,3,4}Post Graduate Scholar, Dept. of Rog Nidana evum Vikriti Vigyana, National Institute of Ayurveda, Jaipur, Rajasthan, India.

²PhD Scholar, Department of Rog Nidana evum Vikriti Vigyana, National Institute of Ayurveda, Jaipur, Rajasthan, India.

⁵Professor, Department of Rog Nidana evum Vikriti Vigyana, National Institute of Ayurveda, Jaipur, Rajasthan, India.

ABSTRACT

Introduction: Due to the rapid modernization in the present era, sedentary life-style and abundance of nutrition, non-communicable diseases have been increased tremendously and now becoming the chief cause of the death all over the world. Obesity is one of the nutritional lifestyle disorder affecting both developed and developing countries. Obesity (*Sthaulya*) is vastly increasing in the world due to the change in the life style (*Ahar*, *Vihar* and *Manasika*) and working conditions. Obesity is a disorder characterized by increased body weight and excess fat deposition. It is the root cause of overconsumption of calories and reduced physical activity and finally leading to serious health complications like Diabetes, Cardiovascular disease and Arthritis. It also reduces the average life span and decreases the quality of life. In *Ayurveda*, *Sthaulya* (obesity) is a condition where, due to aggravation of *Doshas*, there is improper transformation of nutrition, more of *Medodhatu* is formed and inappropriate nutrition goes to nourish other Dhatus of body. **Aim:** To explore the impact of *Ayurvedic* approaches on obesity. **Objectives:** To find out the causative factors behind the prevalence of obesity and also to find out the cheap, easily available *Ayurvedic* modality to treat and prevent the Obesity. **Materials and Methods:** Various literatures like *Charaka Samhita*, *Sushruta Samhita*, *Astanga Hridaya*, modern medical textbooks, journals and online databases are reviewed. **Conclusion:** Embracing a balanced life-style, staying physically active and managing emotional stress are key factors in effectively addressing and preventing obesity.

Key words: Non-communicable disease, *Sthaulya*, Obesity, *Pathya-Apathya*, *Santarpana*, *Ashta Nindita Purusha*

INTRODUCTION

Obesity is defined as having a body mass index (BMI) of 30 or higher. It is characterized by an accumulation of excess fat in the body which may lead to negative effects on health, reduced life expectancy and/or increased health problems. Current estimates suggest

that the global prevalence of obesity has increased by two fold from 1980 to 2014. A major proportion of Diabetes, Ischemic Heart Disease, Hypertension, Ischemic Stroke, Osteoarthritis, and Cancer burden may be attributed to Overweight and Obesity.

In *Ayurveda*, eight *Nindita Purusha* has been described, out of which six are *Loka Nindita* and two are *Chikitsya Nindita* i.e., *Atisthaulya* and *Atikrisha*. *Atisthaulya* (Obesity) is considered under *Astanindita* (contemptible) *Purusha*. It is described as excessive accumulation of *Meda* (fat/adipose tissue) and *Mamsa* (flesh/muscle tissue) leading to flabbiness of hips, abdomen and breast. It is considered as one of *Santarpanottha Vikaras* (disease due to consumption of excessive calories) in *Ayurveda*. *Medodushti* (disorders of fat metabolism) may be one of the risk factors for Ischemic Heart Disease (IHD).

Sthaulya has been mentioned among the *Astanindita Purusha*, one among the most hatred person in the

Address for correspondence:

Dr. Naresh Itani

Post Graduate Scholar, Dept. of Rog Nidana evum Vikriti Vigyana, National Institute of Ayurveda, Jaipur, Rajasthan, India.

E-mail: nareshitani6@gmail.com

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world. A man being obese is feeling ashamed of his body size in the public and thus *Sthaulya* or obesity turns to be a serious health concern indeed.

It is a disease of *Medovaha Srotasa* involving *Medodhatu*. Two types of *Meda Vriddhi* occur in the body i.e., *Baddha (Posya)* and *Abaddha (Posaka) Meda Vriddhi*. The *Baddha Meda Vriddhi* results in adiposity (obesity) and *Abaddha Meda Vriddhi* results in dyslipidemia.

Poshaka Medodhatu/Abaddha (Mobile) Meda

This type of *Medodhatu* is *Gatiyukta* (mobile) and circulates in the *Medovaha Srotas*. This is also called *Poshaka Medo Dhatu* which circulates with the *Rasa-Rakta Dhatu*, to give nutrition to the *Posya Meda Dhatu*.

Posya Medadhatu/ Immobile/ Sthayi Medo Dhatu

This type of *Medodhatu* is *Gativarjita* (immobile) and is stored at various sites of the body.

Concept of Dhatwagni and Dhatuposhan

Agni is responsible for various metabolic activities. It is responsible for any amount of increase or decrease of *Dosha*, *Dhatu* or *Mala*. If this *Agni* gets vitiated then it has an impact on health at microcirculatory level depending upon the *Agni* involved.

If *Agnimandya* is present at the level of *Jatharagni*, then *Ahara Rasa* produced will not be of good quality. In turn the nutrient supply for further *Dhatu* maintenance would get hampered. There will be no production of proper *Dhatu* and the result will be obviously *Dhatu Kshaya*.

If *Agnimandya* is present at *Bhutagni*, then *Ama* would be restricted to *Ahara Rasa* that is the productive juice of food and this *Ahara Rasa* which is not properly formed; cannot be assimilated by *Dhatu*s and results in *Dhatudushti*. It should be noted that *Ama* will be in circulation. This *Ama* can be accumulated in any parts of the body leading to various disorders. Also, it is important to note that which among the 5 types of *Bhutagni* is involved. If one *Bhutagni* is involved, it leads to impairment in nourishment of that particular *Dhatu* which is having predominance of that particular *Mahabhuta*.

If *Agnimandya* is present at the level of *Dhatvagni*, then at that level a particular *Dhatu* would not be able to assimilate (to absorb) nutrients present in the circulating *Ahara Rasa* (productive juice) or circulating *Poshaka Dhatu*. So, such *Poshaka Dhatu*s will be accumulated in *Ahara Rasa* in abnormal quantities and they may further get accumulated at abnormal sites as it goes on circulation continuously. This process of accumulation is termed as *Leenatwa* (deep seated) of *Ama* (especially in *Dhatu*s). Such *Leenatwa* can cause a number of disorders.

Especially when *Medo Dhatwagni* is vitiated; then homologous nutrients present in *Poshaka Medo Dhatu* will be in excess in circulation and this can cause a situation like *Sthaulya* (accumulation of *Meda*). This is because the *Poshaka Medo Dhatu* cannot be assimilated into *Sthayi Medo Dhatu* by *Medo Dhatwagni*. The cause for excess *Poshaka Medo Dhatu* in circulation is not only the *Medo Dhatwagnimandya* but there may be decrease in another *Agni* also. Any reason which can lead to *Kapha Vriddhi*, *Pitta Kshaya* or *Vata Prakopa* can cause this condition. The consequences of such increase in *Poshaka Medo Dhatu* may be *Dhamani Pratichaya*. The excess *Poshaka Medo Dhatu* may accumulate on the walls of vessels and may cause serious complications related to circulation.

Dhamani Pratichaya is considered as one of the *Nanatmaja Kaphaj Rogas*. *Agni* plays an important role in the physiology as well as pathology too. While considering physiology- *Acharya Charaka* says "The life span, complexion, vitality, good health, enthusiasm, plumpness, glow, vital essence, luster, heat and the life breaths are derived from the thermogenic process."

Application of Nyaya's for understanding the mechanism of Dhatuposhana

The *Ahara-Rasa* is a precursor of the body (*Shareera Dhatu*). Its transformation into the *Dhatu* is carried out by the fraction of *Jatharagni* and *Dhatvagni* as well as *Bhutagni*. The *Sneha* after digestion goes through same chain. This internal assimilation process is explained in old classics as *Dhatvagni* and *Bhutagni Vyapara*.

To explain this digestion process and formation of *Dhatu*, the commentators of various *Samhitas* on the

basis of the guidelines given by *Acharyas* has put forward three mechanisms of *Dhatuposhana* which are called as *Dhatu Poshana Nyayas*.

Arundatta clearly supported *Ksheeradadhi Nyaya* by dividing *Dhatu* as *Poshya* and *Poshaka*

Similarly, *Dalhana* had the same view which was further produced by *Arundatta* with a conclusion that - *Rasat Raktam Tato Mamsam* etc. This mechanism of *Dhatu Poshana* can be explained only with the help of *Ksheera Dadhi Nyaya*.

Ghrita (ghee) is one of the food ingredients. So, according to '*Rasapradhanam Aharadravyam, Veeryapradhanam Aushadham*', it will follow the same path of assimilation and will go *Dhatu* to another *Dhatu* but exception is there in the following two cases:

If it is processed with some other medicinal properties i.e., *Siddha* or *Samskarita Sneha Kalpana*, it will be delivered directly to the target accomplished to the specific *Veerya - Karmukata* of the drugs i.e., Targeted Drug Delivery (TDD).

If *Sneha Poshakams* are more than the threshold in *Rasa Dhatu*, this extra quantity will directly reach to the deeper *Dhatu* like *Meda, Majja* etc. The *Sneha* along with nutrient fluid i.e. *Rasa* is circulated continuously in the entire body at the same time, by the *Vyana Vayu* by virtue of its physiological function of circulation. E.g., From the *Ghee* like foods along with the other nutrient; fluids or *Ahara Rasa* are produced and nourish the *Rasa, Rakta, Mamsa, Meda, Majja* and *Shukra*; thus, for the *Shodhana a Sneha Ksheera Dadhi Nyaya (Dhatu Sneha Parampara)* and *Kedari Kulya Nyaya (Yugapat Sarvato Ajasram)* are acceptable. In case of

- *Khale Kapota Nyaya*, the *Dhatu* pick up only its *Poshakamsha* (nutrient content). *Dhatu* are *Poshya* and *Poshaka* which is site of action rendered to *Sneha*. The *Poshaka Dhatu* in *Srotas*, when acted upon by respective *Dhatvagni* and *Bhutagni*, then only it will play supportive or nutritive role for *Poshya Dhatu*.
- The *Khale Kapota Nyaya* is suitable in *Bija Dosh* patients of *Medovridhi*. In this condition whatever

diet is taken; it is directly converted into *Meda Dhatu* due to specific affinity to *Meda Dhatu*. and *Dalhana* clearly explains that by passing two *Dhatu*s i.e., *Rakta* and *Rasa*, only *Meda Dhatu* is excessively formed in the patients of *Medoroga (Sthaulya)*.

- In *Medovridhi*, due to the excessive supply of *Snigdha, Madhura, Guru* etc. types of *Ahara*, the *Ahararasa* contains excessive nutrition homologous to *Medas*. Due to persistent overload, the *Medo Agni* is diminished leading to excessive accumulation of *Sneha* in *Ama* form and thus causing *Rasa Raktagat Medovridhi*.^[1]

Acharya Charaka has laid down the foundation of genetic/hereditary and endocrinal disorders in relation to four pairs of opposing (and undesirable) physical characteristics - height (too tall, too short), body hair (too hairy, hairless), complexion (too dark, too light), and body mass (too obese, too lean). Among these, *Atisthula* (morbid obesity) is the most undesirable characteristic because it is associated with several life-threatening complications including diabetes, hypertension, coronary artery diseases, joint disorders, skin disorders, anorectal problems, etc.

Some key etiological factors of *Atisthula* include dietary and lifestyle indicators (e.g., sedentary habit and high-calorie diet), and genetic and hereditary factors. If we see the pathogenesis of *Atisthula* in detail, *Rasa Dhatu* (plasma) and *Meda Dhatu* (adipose tissue) are involved as important *Dushyas* (affected tissues). Modern medicine has acknowledged the role of *Meda Dhatu* (adipose tissue) as a principal *Dushya*, with obesity and dyslipidemia regarded as the main components of the basic matrix of this disease and its related disorders.^[2-4]

DISCUSSION

In the modern world, obesity has emerged as a serious health issue in both developed and developing nations and is recognized as one of the most serious public health problems of the 21st century.

In 2008, the WHO estimated that globally, at least 500 million adults (or approximately 1 in 10 adults) were

obese, with higher rates among women than men. Obesity is the reason for about 80% of type 2 diabetes, about 70% of cardiovascular diseases, and 42% of breast and colon cancers today. In the past two decades, the number of overweight children and adolescents has doubled.^[5] The rate of obesity also increases with age at least up to 50 or 60 years old. Once considered a problem specific to only high-income countries, obesity has acquired pandemic proportions and is affecting people globally.^[6,7]

Eight inherent sequelae of obesity

The excessively obese have eight inherent defects in them:

तदतिस्थौल्यमतिस्मूर्णाद्गुरुमधुरशीतस्निग्धोपयोगादव्यायामाद
व्यवायाद्दिवास्वप्नाद्दर्शनित्यत्वाद-चिन्तनाद्वीजस्वभावाच्चोपजायते |
तस्य ह्यतिमात्रमेदस्विनो मेद एवोपचीयते न तथेतरे धातवः ||
Cha.Su.21/4

- Reduced lifespan,
- Constricted or limited movement (hampered due to loose, tender and heavy fats),
- Reduced sexual activities or impotence (due to small quantity of semen produced and obstruction of the channel of semen by *Meda Dhatu*),
- Debility (due to *Dhatu* imbalance),
- Emit bad smell (due to the inherent nature of fatty tissues as well as excessive sweating),
- Profuse sweating (since *Meda Dhatu* and *Kapha* are vitiated), and
- Excessive hunger and thirst (due to excessive digestive *Agni* and *Vayu* in the body).^[8]

In *Bhavaprakasha*, it is described that; a person with *Medoroga* suffers from various diseases. These are

1. *Kustha* (skin disease),
2. *Bisarpa* (necrosis or gangrene)
3. *Bhagandara* (fistula-in-ano)
4. *Jvara* (fever)
5. *Atisara* (diarrhoea)
6. *Meha* (diabetes)

7. *Arsha* (haemorrhoids)
8. *Sleepada* (filariasis)
9. *Apachi* (lipomas)
10. *Kamala* (jaundice)
11. *Sweda Daurgandha* (offensive odour of sweat)^[9]

Nidana

Excessive obesity is caused due to

- Over-nourishment as a consequence of the intake of a heavy, sweet, cold and fatty diet,
- Irregular food habit
- lack of physical exercise,
- Abstinence from sexual intercourse,
- Sleeping during the day,
- Uninterrupted cheerfulness,
- Lack of mental activities, and
- Hereditary/genetic defects.

These consequences may lead to an excess of fat (with further accumulation of only fat) and consequent depletion of other *Dhatu*s.^[10]

Pathophysiology of Obesity

According to Acharya Charaka

The obstruction of body channels by fatty tissue causes the *Avarana* of *Vata Dosha* that results in its aggravation. The aggravated *Vata* moves mainly into stomach and increases the *Jataragni*. The increased digestive fire results in increased appetite, quicker digestion and absorption of the food. The next hunger reflex occurs quickly and person craves for more food. This excessive eating produces more production of *Ahara Rasa* which causes over growth of fatty tissue leading to *Sthaulya*.

According to Acharya Sushruta

The etiological factors like *Kapha Dosha* aggravating food items, excessive eating, lack of exercise and day sleep causes the improper digestion of food and results in the production of *Ama Rasa*. The sweet part of *Ama Rasa* moves within the body and *Snighamsa* (unctuous)

part of the *Ama Rasa* causes *Medoroga* which produces *Atisthaulya*.

Among the eight undesirable physical appearance (*Astoninditiya*) based on the criteria like body height, body mass, complexion and presence of hair. The most commonly observed conditions in the society like morbid obesity (*Atisthula*) and extreme emaciation (*Atikrisha*) are *Chikitsiyandita*. It is said that it is comparatively easy to help an underweight person, rather than an overweight person. So, one has to put more effort to overcome it.

Diagnosing obesity/ overweight

There is no single method to diagnose the obesity and we have to go through multiple factors for the assessment of the obesity according to age, weight, sex and height etc. The common approaches adopted in the diagnosis of obesity are

- Physical exam evaluating height, weight, and vital signs, as well as a general head-to-toe assessment
- Complete health history
- History of weight loss efforts, exercise, and eating habits
- Family history review (to evaluate the possibility of inherited factors)
- Blood pressure screening

Nutritional status on the WHO and "Asian criteria" values

Nutritional status	WHO criteria BMI cut-off	"Asian criteria" BMI cut-off
Underweight	<18.5	<18.5
Normal	18.5-24.9	18.5-22.9
Overweight	25-29.9	23-24.9
Pre-obese	-	25-29.9
Obese	≥30	≥30
Obese Type 1 (obese)	30-40	30-40
Obese Type 2 (morbid obese)	40.1-50	40.1-50

Obese Type 3 (super obese)	>50	>50
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Body Mass Index (BMI): Overweight and Obesity are assessed using Body Mass Index (BMI). It is defined as a person's weight in kilograms divided by the square of his / her height in meters (kg/m²).

Body mass index (BMI) = Body weight (in kilogram)/ Height in (metres)²

- Healthy/Normal BMI - 18.5 - 24.9
- BMI of Overweight - 25 - 29.9kg/m²
- BMI of Obesity - ≥ 30kg/m²
- Waist circumference should also be used in addition to BMI to measure Central obesity and disease risk in individuals with a BMI less than 35kg/m².
- Normal range of Waist circumference: Men: 94–102 cm; Women: 80-88 cm
- Hip circumference
- Skin fold
- Waist - Hip Ratio** - The waist circumference is usually measured half way between the superior iliac crest and the rib cage in the mid-axillary line whereas hip circumference is measured one third of the distance between the superior iliac spine and the patella. There is an increased risk of metabolic complications for men with a waist circumference > 102 cm and women with a waist circumference >88 cm. W.H.R. (>1.0 IN men and > 0.85 in woman) indicates abdominal fat accumulation
- Further, following Lab investigations are recommended to assess the risk of other related health problems

Lab tests may include

- Cholesterol levels: Low "good" cholesterol (HDL) and high "bad" cholesterol (LDL) levels, which are commonly associated with obesity
- Fasting blood sugar and hemoglobin A1C (HbA1C) to check for signs of prediabetes or diabetes

- A thyroid test to observe for signs of thyroid disease, commonly linked with obesity
- Liver function tests to screen for the potential of fatty liver disease, which often accompanies obesity
- (ECG or EKG), used to look for signs of heart disease.^[11]

Morbid Obesity Diagnosis

The BMI scale is the primary method for differentiating between obesity and morbid obesity. According to the World Health Organization (WHO), obesity is defined as having a BMI equal to or greater than 30.

Individuals are usually considered morbidly obese if their weight is more than 80 to 100 pounds above their ideal body weight.

A more widely accepted and more exact way to define morbid obesity is with the body mass index (BMI). A BMI above 40 indicates that a person is morbidly obese and therefore a candidate for bariatric surgery.

Bariatric surgery may also be an option for people with a BMI between 35 and 40 who suffer from life-threatening cardiopulmonary problems, diabetes, or other medical problems listed below. However, as in other treatments for obesity, successful results can be affected by motivation and behavior.^[12]

Ideal body proportion (Healthy person)

A person with a balanced proportion of muscles and compactness of the body and firmness in sense organs is not overcome by the onslaught of disorders. Such people can tolerate hunger, thirst, the heat of the sun, cold and physical exercise. Their digestion, assimilation of food and muscle metabolism is in a state of equilibrium.^[13]

- Obesity is defined as a condition of abnormal or excessive fat accumulation in adipose tissue, to the extent that health becomes impaired. The amount of excessive fat in absolute terms, and its distribution in the body.
- Either around the waist and trunk (abdominal, central or android obesity) or

- Peripherally around the body (gynoid obesity)- have important health implications.^[14]

Acharya Charaka has explored this condition from the standpoint of their diathesis, clinical presentation, and management, which is comparable to approaches taken today to the study of obesity. *Acharya Sushruta* has considered *Rasa Dhatu* as the main culprit for obesity.^[15]

Set point theory and concept of *Dhatwagni*

The amount of fat in the body, also known as total body adiposity, is a major component of body weight. Although it may go up and down from time to time, the amount of body fat (and hence body weight) most people carry is relatively stable and appears to be controlled or maintained at a level that is sometimes called a "set point."

The best evidence for this is that when people go on a diet and voluntarily eat less food, most are able to lose at least some weight. However, throughout time, as attention to maintaining the lost weight decreases, body weight creeps back up, generally to about the same level as occurred before the dieting began. This discouraging outcome may occur several times for some individuals throughout their lifetime as they keep attempting to lose weight; i.e., they try one or another diet that is popular at the time, lose some weight, and then regain it throughout a period of weeks or months.

If body fat tissue is removed by means other than dieting, for example when someone undergoes lipectomy or liposuction to reduce body fat, the typical result is that while body weight is initially lowered, the person increases the amount of food eaten, allowing body fat to return to its former, pre-operation level.

If a person's weight starts creeping up, the body secretes more leptin and insulin, and these in turn act on the brain to reduce food intake; similarly, when weight is reduced by dieting or other means, the reduced hormone levels signal the brain to increase appetite. Because of these processes, it is difficult for most people to maintain a weight that is different from their set point for long periods of time.

Lipid precursors are acted upon by fat-specific energy (*Medhodhatvagni*) for their conversion into adipose

tissue (*Meda Dhatu*).^[16] Vitiating of *Kapha Dosh* and excessive accumulation of *Medhodhatvagni* and *Mala* (waste products) of *Meda Dhatu (Kleda)* lead to dysfunction of adipose tissues.

Medovaha Srotasa (adipose channels) have two origins - (*Vrikka*) kidney, adrenal and fat around them and other are visceral and omental fat (*Vapavahana*).^[17] These channels draw nutrition, including lipid from the antecedent flesh and transient lipid (temporary) and then convert them into a stored form of lipid.

As per biomedical science, obesity is associated with increased adipose stores in the subcutaneous tissues, skeletal muscles and internal organs such as kidney, heart, liver and omentum. Adipose tissues (*Meda Dhatu*) form a crucial link to the concept of tissue metabolism.

Low levels of fat-specific energy (*Medodhatvagni*), despite a normal food intake, can lead to a steady accumulation of fat and the outcome is obesity.^[18,19]

Increased desire to eat among the obese

Acharya Charaka has correlated an increased desire to eat with increased *Agni* in the morbidly obese. Recent evidence suggests that leptin and ghrelin had shown their influence on appetite. As ghrelin is produced from the stomach, and leptin is produced by the adipose tissue of fat storage reserves in the body, which is responsible for short-term and long-term appetite control respectively in the body.^[20]

In the brain melanocortin pathway has a specific role in stimulating appetite, which is located in the area of the lateral hypothalamus (LH) and ventromedial hypothalamus (VMH) and arcuate nucleus. These areas are directly related to the feeding and satiety centers.^[21]

There are two distinct groups of neurons in the arcuate nucleus viz- The first group contains neuropeptide Y (NPY) and agouti-related peptide (AgRP) and the second group contains Pro-opiomelanocortin (POMC) and cocaine and amphetamine regulated transcript (CART).

The first group of neurons i.e., NPY/AgRP exerts stimulatory inputs to the LH which stimulate feeding while inhibitory inputs to the VMH, and inhibit satiety.

The second group of neurons i.e., POMC/CART suppresses feeding and increase energy expenditure in response to circulating adiposity signals such as leptin. Leptin is a peptide hormone that is produced by fat cells that plays a role in body weight regulation. It does this by acting on the hypothalamus to suppress appetite and burn fat stored in adipose tissue (body fat).

Hence, the leptin deficiency or leptin resistance leads to develop overfeeding tendency, which is caused by some genetic and acquired forms of obesity.^[22,23] These findings suggest the genetic inputs in overweight and obesity, which is quite comparable to the Ayurvedic lexicons. Leptin stops one to feel hungry and satiety. So, if leptin is absent, one feel hunger and overfeed and becomes obese.

Consequences of obesity

Serious diseases are the outcome of excessive obesity due to obstruction of body channels by the *Meda Dhatu*. This indicates ancient wisdom of *Ayurveda* scientists, which is comparable to the impact of obesity on health perspectives of biomedical science.^[24] We have yet to understand what they had foreseen in reference to fat accumulation around the kidneys. Decreased life span is stated to be an important consequence of obesity in *Ayurveda*.

According to contemporary science, metabolic and psychological pathologies are often present together and are associated with dysregulation of the hypothalamic-pituitary-adrenal axis (HPA axis).^[25] Affect disorders are also reported among obese binge eaters. The National Institute of Health, USA has issued an alert labeling obesity a "Killer disease" due to its health-related consequences such as coronary disease, diabetes mellitus, hypertension, hyperlipidemia, kidney disorders, gallbladder disorders, cancer of colon, pancreas, breast, uterus, kidney and gallbladder, osteoarthritis, menstrual irregularities in females, cryptogenic cirrhosis of the liver and hepatocellular carcinoma, insulin resistance, and physiological hyperinsulinemia.

Some of the social consequences of obesity could include divorces, due in part to reduce sexual activities

between partners. Besides there, transitional physiological phases such as weight gain during adolescence in boys and girls, post-natal weight gain in women, and peri-post menopausal obesity are frequently noted in clinical settings that warrant special care and management.^[26-32]

Ayurvedic management

Line of Treatment

Shamana (Palliative) treatment

- *Langhan* (Fasting)
- *Ama Pachan* (oral use of digestives to augment the fat metabolism)
- *Ruksha Udwartan* (Dry medicated powder massage) - *Udvardana* is widely accepted, due to its properties like *Vatahara* (alleviates *Vata Dosha*), *Kapha Meda Vilayana* (liquefies *Kapha* and *Meda*), *Angasthirikarana* (provides firmness to body), *Twak Prasadakara* (cleanses the skin)^[33]
- Food and drinks that alleviate *Vata* and reduce *Kapha* and *Meda Dhatu* (fat).
- Heavy and non-nourishing diet/items like honey, salad etc. are advised.
- Physical exercises, mental work is also recommended.

Samshodhana Chikitsa (Purificatory procedures)

- If an *Atisthula* person possesses good stamina and strength, they should be treated with *Vamana* and *Virechana* therapies.
- Non-unctuous, warm and strong enema are advocated in such type of patients.

Single drugs: *Guduchi*, *Vidanga*, *Musta*, *Sunthi*, *Amla*, *Vaca*, *Daruharidra*, *Guggulu*, etc.

Compound Formulations: *Medohara Guggulu*, *Amritadi Guggulu*, *Arogyavardhani Vati*, *Trikatu*, *Navak Guggulu*, *Triphala Guggulu*, *Vidangadi Churna*, *Takrarishta* (a fermented medicinal preparation of buttermilk, *Navayasa Lauha* etc. are recommended for the management of obesity

- A formulation prepared from *Vidanga*, *Nagara*, *Yavakshara*, ash powder of black iron along with

honey, powder of *Yava* and *Amalaka* is also an excellent weight-loss drug.

- Similarly, *Bilvadi Panchamula* (five major roots) mixed with honey and *Shilajatu* along with the juice of *Agnimantha* are also very effective preparations for weight-loss.
- A diet consisting of *Prashatika*, *Priyangu*, *Shyamaka*, *Yavaka*, *Yava*, *Jurnahva*, *Kodrava*, *Mudga*, *Kulattha*, *Chakramudgaka*, *Adhaki* along with *Patola* and *Amalaka* is very effective in tackling obesity and maintaining good health.
- Honey water and alcoholic preparations may be taken as postprandial drinks that help in reducing excessive fat and muscle tissues, while also alleviating *Kapha Dosha*.
- Regarding physical exercise, it not only reduces body weight but also counteract metabolic adaptation but regulating nutritional balance set point. It is presumed that physical inactivity contributes to both visceral adiposity and cerebellar brain changes because in the area of cerebellar cortex and hippocampal dentate gyrus of brain show enhanced synaptogenesis and neurogenesis in response to physical exercise training.
- *Yogic* practices have a significant impact on the physical, mental, emotional and spiritual health of the individual. It is reported that a significant improvement in the levels of BP, LDL cholesterol, and BMI can be noted after three months of residential therapy consisting of vegetarian diet and *Kriya Yoga*.
- A randomized controlled study reveals that practicing *Yoga* for a year brought about significant improvement in body weight and body density. Regular practice of *Yoga* has shown to improve the serum lipid profile in patients (with known IHD) as well as in healthy subjects.
- A regular regimen of *Praṇayama* reduces stress hormone and levels of endorphin and enkephalin, consequently increasing the level of HDL while decreasing the level of LDL, VLDL and TGs.

CONCLUSION

The study concludes that obesity, or *Sthaulya*, is a multifaceted health condition with implications for physical, emotional, and psychological well-being. While modern medicine continues to advance in its understanding and management of obesity, *Ayurveda's* holistic approach can complement conventional treatments. Embracing a balanced lifestyle, staying physically active, and managing emotional stress are key factors in effectively addressing and preventing obesity. It is essential to consult healthcare professionals and *Ayurvedic* practitioners for personalized advice and guidance on managing *Sthaulya* safely and effectively.

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