

## “Review article of Sthoulya (Obesity)”

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**Abstract:** The present paper is based on Ayurvedic disease “Sthoulya.” Here we can compare it with modern disease “Obesity”. Man in the true sense is one who has the ability to discriminate and so, is a gifted creation. In the present era, Man has become alien to Nature and hence today, we have advanced medicines and many increasing diseases as well. We have complicated our living. In short, we are alien to or away from Nature. Since recent times, we have been talking about lifestyle disorders. Among these lifestyle disorders, a major share is attributed to Obesity, similar to its bulky nature. The following lines talks about obesity, lifestyle, prevention and management aspects. We talk about lifestyle without understanding life and knowing what lifestyle is. So, it is the knowing and understanding of life and all the aspects attributed to life synonymous with *Ayurveda*, which can address these issues effectively. There are many references for Ayurvedic management of Sthoulya that we have to apply in modern time. Finally main intention for presenting this paper is to share basic details of Sthoulya for proper Treatment.

**Key words – Sthoulya, Medorog, Atisthulata, Agnimandya, Atinindit vikar etc.**

**Introduction:-** In Ayurveda, there is description of many diseases and their management as well as lifestyle for healthy living. Sthoulya is one of the disease which has frequent effects. It can be correlated with Obesity in modern science. Person who are strong, who have taken food, who consume more quantity of food (habitually), who are fatty, those endowed with (strong) mind and age(youth) and who belong to such a family, who have more of fat and kapha and less of vata and pitta (in their constitution) and who have strong fire (digestive activity) leads to Obesity. Lastly It leads to Death. Actually Obesity is the state of being Obese, meaning extremely fat or corpulent. The word Obese is derived from the Latin root “Obesus” meaning fat, the French word is “obedo”, its past participle – Obesus, meaning to eat away or devour. Thus, in simple terms obesity is an abnormal increase of fat in the subcutaneous connective tissues. The other synonyms of fat are adipose and lipid, which are derived from a Latin root “adeps” – fat and Greek root “lipos” – fat respectively.

Obesity is identified as a nutritional disorder very recently since last thirty years or so in the modernized world. It still thrives as one of the most important, yet preventable diseases. Amazingly, the concept of obesity has been stated lucidly by the ancient texts of Ayurveda, which dates back to 15<sup>th</sup> century BC. Obesity refers to *Atisthualya* or *Medo roga*, which corresponds to the primary and secondary types of obesity in the present context respectively. *Sthula* refers to obese and *Sthaulya* to obesity.

### Materials & Method:-

All Ayurvedic and Modern literature related to Sthoulya.

Details are as follows –

#### Ayurvedic and Modern view

In *Ayurveda*, obese persons are among the eight undesirable phenotypes. The context of obese personality as mentioned in *Caraka Samhita* comes to light when there is the need to abridge the gap between the drug and the disease in an individual. Herein, we have three entities, namely the drug (*dravya*), the disease (*Roga*) and the individual affected with the disease (*Rogi*). So, when talked about the individual, what should be his personality to withstand the usage of the drug? The overall potency of the drug is seen in a well-built individual and in the undesirable types especially, the obese and the emaciated, the use of medicines should be

with utmost care. Thus, treatment is restricted in case of these two undesirable phenotypes. Speaking about the obese, who is considered even more worse than the emaciated, the following points are significant.

*Ayurveda* describes obesity in a simple and yet a powerful way, based on both subjective and objective modes. As already stated, obesity is one among the eight undesirable constitutions and in addition to emaciated form the most unwanted distinct features than the others (remaining six – which are too long, too short, too fair complexion, too dark complexion, with plenty of body hairs and with absence of body hairs). Obese people have eight inherent defects – *Astau doshah*, which are as follows,

1. Decrease in lifespan
2. Slow or sluggish body movements
3. Difficulty in sexual intercourse
4. Weakness
5. Emit foul smell from the body
6. Excessive perspiration
7. Excessive hunger
8. Excessive thirst (Ref: *Caraka Samhita, sootrasthana, 21<sup>st</sup> chapter*)

**Definition** – Structurally speaking, the state of obesity is characterized by an increase in the fatty mass at expense of the other parts of the body. The water content of the body is never increased in the case of obesity. Although obesity can easily be identified at first sight, a precise assessment requires measurements & reference standards.

### Tests for Obesity –

*Obesity is a concept that is being continually redefined.* Various tests are used in the diagnosis of Obesity. Some of these are listed below:

- Body Mass Index (BMI)
- Weight-for-height charts
- Skin fold thickness measurement
- Bioelectrical impedance analysis (BIA)

Body Mass Index Associated Disease Risk		
Obesity class	BMI (Kg /m <sup>2</sup> )	Risk
Under weight	< 18.5	Increased
Normal	18.5 – 24.9	Normal
Overweight	25.0 – 29.9	Increased
Obesity - Grade – 1	30.0 – 34.9	High
Obesity - Grade – 2	35.0 – 39.9	Very high
Extreme obesity	≥40.0	Extremely high

### FAT DISTRIBUTION:

*Medas tu sarvabhutanam udare hi vyavasthitam I*

*Atah eva udare vriddhi prayo medasvino bhavet II*

*Bhavaprakasha Madyama khanda, 39/3*

The verse can be correlated with the present concept of Central Obesity, associated with a distinctive metabolic disorder called the syndrome X, characterized by abdominal obesity, insulin resistance, hypertriglyceridemia, low serum HDL, hypertension and high risk for coronary artery disease.

### CAUSATIVE FACTORS:

The cause of obesity is complex and is one of multiple causation. Based on the causative factors two types of obesity are described.

- ❖ Primary – as an independent disease
- ❖ Secondary – due to underlying disease

In scientific terms, obesity occurs when a person consumes more calories than he or she burns. What causes this imbalance between calories in and calories out may differ from one person to another. Genetic, environmental, psychological, and other factors may all play a part.

### SECONDARY CAUSATIVE FACTORS:

Although to some extent, obesity is caused by underlying disorders, the main cause is probably lifestyle. The problem has two basic issues: too much food, too little activity. High calorie diets from processed foods and fats make it easy to add weight. Sedentary lifestyles without adequate exercise make it hard to tackle the issue of obesity. Following is a list of possible conditions causing secondary Obesity,

1. **GENETIC SYNDROMES:**
2. **ENDOCRINE FACTORS:**
3. **DRUG INDUCED:**
4. **HYPOTHALAMIC DAMAGE:**

### SOCIETAL CAUSES:

While it is often quite obvious why a certain individual gets fat, it is far more difficult to understand why the average weight of certain societies has recently been growing. While genetic causes are central to who is obese, they cannot explain why one culture grows fatter than another.

### CAUSES OF OBESITY AS PER AYURVEDA:

The cause of diseases as per Ayurveda is basically categorized into three, namely,

1. *Asatmendriya Indriya Artha Samyoga* – The unhealthy conjunction of the sense organ with its respective object
2. *Pradnyaparadha* – Intellectual inadequacy to distinguish the good from the bad. *Acharya Chakrapani* broadly classifies the intellectual level into three. They are *Dhi*, *Dhruti* and *Smruti*, while *Dhi* refers to the power of discrimination *Dhruti* is the power of restraint and *Smruti* is the power of recollection (Memory).
3. *Parinama* – Seasonal variations

The first two are the major causes as far as obesity is considered, a person who loses control, to limit his food intake and resort to healthy lifestyle are the prime causes.

#### *Laulyam kleshakaranam I*

*Ashtanga Samgraha, Sootrasthana, 13 / 4.*

As mentioned earlier, excessive indulgence leads to unhappiness. Here, in the case of obesity, *Jihva laulya* is one among the foremost causes. The nature of food intake, are sweet, cold potency, unctuous and nourishing. This leads to over nourishment and not proper nourishment.

## CONCEPT OF FOOD METABOLISM-MODERN PHYSIOLOGY

After absorption, the food undergoes metabolism, that is, (1) it is broken down into simpler and still simpler compounds to provide energy. – A process called catabolism, (From Greek, Katabole – a casting down) or (2) new compounds like glycogen, fat and protein synthesis from these simpler compounds as mentioned. Which are either stored or incorporated in the body tissue to form structural tissues, enzymes or hormones - a process called anabolism (From Greek, anabole – a rising up). These two components are collectively called as metabolism.

### FAT OR LIPIDS:

Wilhelm Bloor, father of modern lipid chemistry defines lipid as substances – Which are actual or potential esters of fatty acids and insoluble in water and soluble in alcohol, ether, benzene, petroleum ether and acetone.

### TRIGLYCERIDES:

These are esters of glycerol with fatty acids. The common fatty acids in the human body are Palmitic, stearic and oleic acids, all of which are long chain fatty acids. Subcutaneous fat, fat in the omentum and other depots of fat in man are mostly triglycerides. (CPP) structure. Steroid hormones important for human physiology, biochemistry and medicine are Cholesterol, Bile acids, sex hormones – estrogen, progesterone and testosterone, Vitamin D and Digitalis glycoside.

**PLASMA LIPIDS:** The sources of plasma lipids are two, 1.Endogenous: Lipids mobilized from adipose tissue and those from liver. 2.Exogenous: Food

Plasma lipid values	
Lipid	Values (mg / 100 ml)
Cholesterol	140 - 250
Triglycerides	30 - 150
Phospholipids	150 – 300
Free fatty acids	10 – 30
<b>Total lipid</b>	350 – 800

**Cholesterol** (from Greek, Chole – bile, sterol – solid, i.e. solid material from bile) in our body exists in two forms, the esterified and non – esterified or free cholesterol. Within the RBC, the cholesterol is mostly free. In disease of lipid metabolism, when the blood cholesterol values changes, it is the esterified portion that mainly changes. Therefore, plasma cholesterol, which consists of esterified cholesterol, shows changes at an early stage of the disease and so is a more sensitive index than whole blood cholesterol.

### FACTORS INFLUENCING PLASMA LIPID VALUES:

#### HORMONES:

Insulin reduces plasma lipid values (old standing diabetes have sometimes abnormally high values of plasma lipids, which however may not always be controlled by insulin and diet control. Insulin inhibits

Lipolysis, by inhibiting hormone sensitive lipoprotein lipase in adipose tissue and thus the free fatty acids concentration is lowered.

### **NUTRITIONAL FACTORS.**

Persons are races, who use high quantity saturated fats in their foods are more vulnerable to hyperlipidemia

### **EXERCISE:**

People who work hard usually tend to have comparatively low plasma lipid values.

### **HEREDITY:**

To some extent, plasma lipid values are dependent on heredity.

### **CATABOLISM OF FATTY ACIDS:**

The fatty acids are catabolised by a process called Beta oxidation within the mitochondria of a cell. The end products of fatty acid catabolism are active acetate molecules, which immediately enter the Krebs cycle by combining with the 4-carbon structure, oxalo acetic acid (OAA) to form Citric acid (6 -carbon structure), in the liver. Therefore, Oxalo acetic acid (OAA) is the key substance and if not available in sufficient amounts, the active acetates will accumulate in the liver. In diabetes mellitus, the glucose catabolism is not sufficient and so there is deficiency of OAA.

### **THE MODERN VIEW ON THE PATHOLOGICAL BASIS OF OBESITY**

The exact mechanism is not yet fully understood, as it is believed to be very complex. The probable understanding of the disease is as follows.

There is a finely regulated inbuilt mechanism to balance the equation of food intake and energy expenditure. Neural and hormonal pathways form this mechanism. Whenever there is excess food intake, so does the calorie consumption is promoted by way of various activities. On the contrary, if there has been no energy input. The body craves for food or rest, thus tries to strike balance. This fine balance is maintained by an internal set point called the **lipostat**, which can sense the energy required or energy to be spent. With the identification of leptin in 1994, there have been remarkable developments in unfolding the mystery of lipostat. Broadly speaking, three components of this system has been identified,

1. The afferent system, which generates humoral signals from the adipose tissue (Leptin), pancreas (Insulin), and stomach (Ghrelin).
2. The central processing unit primarily located in the hypothalamus integrates the afferent signals.
3. The effector system, which carries out orders from the hypothalamic nuclei in the form of feeding behaviour and energy expenditure.

It is found that the role of leptin is more important than insulin in this system. Through leptin, the adipocytes communicate with the hypothalamic centers, which control appetite and energy consumption. High levels of leptin indicate an increase in adipose tissue. Leptin crosses the blood brain barrier and binds to its receptors, which have two effects, inhibits anabolic circuits, which promotes food intake and inhibits energy expenditure. Through a distinct set of neurons, leptin triggers catabolic circuits. The net result is that there is reduction in food intake and promote energy expenditure. Thus, over a period of time, adipocytes are reduced and weight is lost. This in turn lowers the circulating leptin level and a new equilibrium is reached. This cycle is reversed when adipocytes are lost and hence leptin levels are low. The anabolic circuits are activated and catabolic circuits are inhibited resulting in net weight gain.

**BASIC PRINCIPLES AND METABOLISM IN AYURVEDA:**

As per Ayurveda, The body is based on the *dosha*, *dhatu* and *mala*, which are also made up of *Panchamahaabhuta*. This body is a product of *Aahaara* or the food. The *dosha* are those, which tend to vitiate the other bodily forms and produce disease. Also they give rise to specific temperament and can produce disease independently.

*Dushayanti iti doshah I*

*Prakriti janakatvey sati swatantryena dusti kartritvam doshatwam. I*

*Caraka Samhita sutrasthana*

*Dhatu*s are those, which nourish and support the body. Also that which supports the body mind and life is known as *dhatu*.

*Sarira dharanath Dhatavah I Dhadathi dattey vaa sarira manah pranaan*

The *Malas* are those, which pollute the structures, being themselves waste products of food. Also that, which purifies the body after getting itself eliminated.

*Malini karanaath, ahara malatwat malah I Mriyathey Sodhyatey anena iti malah*

Therefore, the equilibrium of these *doshas*, *dhatu*s, *malas*, the digestive fire and the cheerful disposition of the soul, mind and sense organs is termed as health. Thus, we see that all the components in equilibrium are essential in preserving health.

With respect to Obesity, we find that it is a *Medo dhatu roga*. How does the supporting structure such as a *dhatu* produce the disease Obesity or *Sthaulya*?

As mentioned earlier, that *dosha* is the factor, which contributes to disease formation. It is true in this case too. It is the excessive *Kapha Dosha*, which gets lodged in the *Medo dhatu* which gives rise to *Sthaulya* and *Prameha*. (*Ashtanga. Samgraha sutrasthana. 19/21*)

**Nirukthi of Meda:**

*Sandra snigdhas tu medurah I*

*Amarakosha 3. 1.30*

That which is unctuous is *Medas*. It is located in the region of heart and near the navel in the form of omentum, measuring a handful.

*Medo dhatu* or the fat tissue in its normalcy provides *Snehana* or the unctuousness to the body. The optimum level of unctuousness of the body and the mucous layers of the eye, strength and nourishment to the bones are provided. (*Ashtanga. Samgraha, sutrasthana. 19/2*)

**Medo vaha srotas:**

*Medo vahaanam srotasam vrukkou moolam vapaavahanan ca*

*Caraka Samhita Vimanasthanam 5 / 8*

The kidneys (Perinephric area) and Omentum are the origin of *Medo vaha srotas*.

Every healthy person has some fat in his adipose tissue, which can be mobilized when there is lack of energy input (starvation) to provide energy. Teleologically, therefore some extra fat is desirable.

**Brumhana and Langhana:**

Anything, which causes lightness of the body, is termed as *Langhana*, and those which build up the body is *Brumhana*.

***Sthaulyam ati ca atyarta brumhite I***

*Caraka Samhita sutrasthana 22 / 38*

On the contrary, eating without the need or absence of hunger is a burden to the body system, be it even highly nourishing food. Herein the benefits of nourishment are never seen and there is discomfort and heaviness felt. At this juncture, when the person observes fast, which is appropriate to digest the excessive load over the digestive system, he feels nourished. Here in this context fasting acts as nourishment. This is well explained in *Jwara chikitsa*.

**THE PATHOPHYSIOLOGY OF STHAULYA:**

Proportionate musculature and compactness no doubt have strong sense organs as well as motor organs, not easily susceptible to illness. They can withstand thirst, hunger, extreme temperatures of heat and cold and strain. Proper digestion and assimilation takes place in those who are well built. So in an obese the contrary can be seen. Before going into the pathology of obesity, understanding the common principles of *dhatu vriddhi* is a prerequisite.

**Firstly,*****Dhatavah khalu sarirah samanaihi samana guna bhuyistaiye ....***

The *dhatu*s generally undergo increase with the usage of food and activities, which are similar to the *dhatu* constituents. In the case of *Medo dhatu*, it is predominantly made up of *Prithvi* and *Jala Mahabhutas*. So, foods and activities, which increase the similar *Mahabhutas*, contribute to the increase in *Medo dhatu*.

**Secondly,**

The *dhatu*s undergoes increase or decrease when their *Dhatwagnis* become sluggish or overactive respectively.

***Poorvo dhatu param kuryat vriddhi kshya cha tat vidam I***

*Ashtanga Samgraha Sutrasthana, 19/ 14*

In the normal physiological terms, the preceding *dhatu* gives rise to the succeeding one. The nature, being either increase or decrease of the preceding *dhatu* is reflected in a similar manner upon the succeeding *dhatu*.

With this basic information, let us see what goes wrong in the obese.

***Rasa nimittham eva Sthaulya karshyam ca I***

*Susruta Samhita, Sutrasthana, 15 / 32*

Both corpulence and emaciation are dependent on the *Rasa dhatu*. How can this single entity *Rasa*, be the cause for these two entirely dissimilar attributes? The word *ca* as per *Dalhana* implies the *Madhya Sarira*, which emphasizes that obesity or emaciation is apparent in the trunk region, the central obesity as mentioned earlier.

In the case of an obese, inspite of his strong digestive power, due to over eating there is formation of *Aama rasa*. The commentary of *Dalhana* explains, that the formation of *Aama rasa* is at the level of *dhatu* as it

is the improper digestion due to weakness of the *Dhatwagni*. The *dhatu* referred here is the *Medo dhatu* and its *Dhatwagni*.

### WHY IS THERE A VERY STRONG DIGESTIVE FIRE IN AN OBESE?

*Medasa avruta margatvat vayuh koste visheshatah .....*

*Caraka Samhita, Sutrasthana, 21 / 5*

*Vaata dosha* is vitiated by loss or depletion of body tissues and also due to *Sanga*, *Aavarana* etc. In case of obesity, the *avarana* or the envelop of *medas* is the main triggering factor for *Vaata aggravation*. Thus, we see that *Vaata dosha* is increased due to confinement and is not *kevala Vaata* (i.e.) *Vaata* is not the only *dosha* but with the background of *Medas* and *Kapha*. Hence, the plump obese person is weak though the body looks gross as both *Vaata* and *kapha doshas* are vitiated.

In an obese, other tissues do not manifest to the extent fat grows. This means that the preceding *dhatu*s such as *Rakta* and *Mamsa* are also increased, but the increase is very mild. With regard to the succeeding *dhatu*s these are never nourished in the obese, which implies that there is no new formation of these *dhatu*s. (*Sesha dhata vah na apyayante*), *Dalhana*. The food of an obese is predominantly of sweet taste and excessive sweet is harmful to the body as said by *Vagbhata*. Normal amount of sweet is nourishing, but excess causes dullness of the digestive mechanism, and so does not nourish the body.

### COMPLICATIONS OF OBESITY

Sr.No	System	Diseased state
1	Gastrointestinal	Gall stones, Pancreatitis, Abdominal hernia, non – alcoholic fatty liver disease (NAFLD) which includes Steatosis, Steatohepatitis and cirrhosis. Possibly Gastroesophageal reflux disease
2	Endocrine / Metabolic	Metabolic syndrome, Insulin resistance, Impaired glucose tolerance, Type 2 Diabetes Mellitus, Dyslipidemia
3	Cardiovascular	Hypertension, Coronary heart disease, Congestive cardiac failure, arrhythmias, pulmonary hypertension, Ischemic stroke, Venous stasis, Deep vein thrombosis, Pulmonary embolus
4	Respiratory	Abnormal pulmonary function, obstructive sleep, apnea, obesity hypoventilation syndrome, Asthma
5	Musculoskeleton	Osteo arthritis, Gout, Low back pain, <a href="#">Carpal tunnel syndrome</a>
6	Gynecological	Abnormal menstruation, infertility
7	Genitourinary	Urinary stress incontinence
8	Ophthalmology	Cataract
9	Neurological	Idiopathic intracranial hypertension (psuedomotor cerebri)
10	Cancer	Esophagus, colon, gall bladder, prostate, breast, uterus, cervix kidney.
11	Post operative events	Atelectasis, pneumonia, Deep vein thrombosis, Pulmonary embolus



Source: Klein S, Wadden T, Sugerman H.J: AGA technical review on Obesity. Gastroenterol 123: 882, 2002.

### TREATMENT / MEDICINE:

The nature of medicine should be as follows,

...*Tikshna, ushna, ruksha, chedi cha bhashajam I*

*Ashtanga Samgraha Sutrasthana, 24 / 28*

### SHAMANA:

Besides many formulations, there are few drugs of choice mentioned in *Sthaulya*,

1. **Guggulu** – mentioned in *Ashtanga Samgraha* and *Caraka Samhita*, Herein purana guggulu is to be used. It is the foremost drug, which alleviated meads and vata dosha.

***Guggulu medo anila haranam I***

*Ashtanga Samgraha, Sutrasthana, 13 / 2*

2. **Rasaanjana** – Vagbhata in his *Ashtanga Hridaya* has emphasized *Rasaanjana* as the foremost drug in alleviating obesity.

*Sthoole Tarkshya I*

*Ashtanga Hridaya, uttarasthana, 40/ 49*

***Daarvi Kwatha samam kshiram Pada pakvam Yada Ghanam I***

***Tada Rasaanjana Kyatham Tat netra yoho param hitam II***

*Ayurveda Prakasha, 2 / 234*

The decoction of *Daarvi* (*Berberis aristata*) is boiled with equal quantity of goat's milk until a thick consistency is obtained. Thus, prepared form is called *Rasaanjana*, which is highly beneficial to eyes.

3. **Guduchi** (*Tinospora cordifolia*) - In *chikitsa kalika* by *Trishatacharya Guduchi* is considered best drug for obesity.

### CARAKA SAMHITA:

- Intake of *Vidanga* (*Embelia ribes*), *Naagara* (*Zingiber officinale*), *Yava kshara* (Alkali of *Hordeum vulgare*), *Bhasma* of black Iron, *Amalaki* (*Emblia officinalis*) along with the powder of *Hordeum vulgare* and honey.
- Drinking *Shilajatu* dissolved with the decoction of *Agnimantha* (*Clerodendrum phlomidis*) cures obesity.
- *Brihat pancha moola* (Roots of *Aegle marmelos*, *Oroxylum indicum*, *Gmelina arborea*, *Stereospermum suaveolens* and *Clerodendrum phlomidis*) along with honey is administered orally.

**CONCLUSION:**

To conclude, right outlook about lifestyle through proper awareness is the ultimate step in addressing this key issue of over nutrition. Treatment is only secondary. Lifestyle is a continuous process in the life's progress and so a continued effort is essential to prevent and tackle the issue of obesity. In brief, what is needed is a modern version of *Swastavritta*.

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