



## UNIQUE JOURNAL OF AYURVEDIC AND HERBAL MEDICINES

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Review Article

### A REVIEW ON STHAULYA (OBESITY) AND ITS MANAGEMENT IN AYURVEDA

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Received 11-10-2014; Revised 09-11-2014; Accepted 07-12-2014

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### ABSTRACT

Obesity is not because it runs in the family; it is because no one runs in the family. Sthaulya has been included by Acharya Charak among ashtauninditiya pursha. Obesity has become epidemic today and it is essential to understand the consequences of obesity. In a world where food supplies are intermittent, fat cells, residing within widely distributed adipose tissue depots, are adapted to store excess energy efficiently as triglyceride and, when needed, to release stored energy as free fatty acids for use at other sites. This physiologic system, orchestrated through endocrine and neural pathways, permits humans to survive starvation for as long as several months<sup>1</sup>. However, in the presence of nutritional abundance and a sedentary lifestyle, and influenced importantly by genetic endowment, this system increases adipose energy stores and produces adverse health consequences such as obesity. In last 30 years obesity has increased in both sexes, all age groups and in all racial/ethnic groups. Obesity is a blessing of the modern age of machines and materialism. A new research has shown that obesity can shorten your life span by 8 years. Obesity has become life style disorder. These individuals can easily develop diabetes or cardiovascular problems early in life, this excess weight can rob them of nearly two decades of healthy life. It has become essential to understand aetiopathogenesis and management of sthauya due to dreadful consequences. In this article Ayurvedic remedies with yoga techniques are described to overcome complications of obesity.

**Keywords:** Sthaulya, Medoroga, Vikar, Bijdosha, Dushya.

### INTRODUCTION

Obesity is a state of excess adipose tissue mass. "Overweight" refers to an excessive amount of body weight that includes muscle, bone, fat, and water<sup>2</sup>. In Ayurveda Obesity is regarded as Medoroga –A disorder of Meda Dhatu- Adipose tissue and fat metabolism and one of the undesirable Constitutions. Sthaulya is considered as a santarpan janya vikar. (An excess nutritional disorder). Acharya charaka was the first to present a detailed account of Sthaulya<sup>3</sup>. Atisthula is one among the Ashtaunindita Purusha described by him. He has described its causative factors mainly to be exogenous and hereditary type (Bijadosha), its etiopathogenesis, prognosis and management. Exogenous causes are meda (fat) potentiating diet and regimens, whereas dosha, dhatu, Mala, Srotas etc. come under the endogenous factors. In the pathogenesis of sthauya, all the three doshas are vitiated, especially Kledaka Kapha, Pacaka Pitta, Samana and Vyana Vayu are the Doshika factors

responsible for the samprapti of sthauya. Aama annarasa traveling in the body channels gets obstructed in the Medovaha Srotas owing to the khavaigunya due to bijasvabhava or sharir shaithilya and combines with kapha and meda, decreasing the medo dhatvagni which in turn gives rise to augmentation of meda. Vitiated Vyana Vayu propels this augmented meda dhatu to its sites viz. udara(abdomen), sphika(hip region), stana(breast), gala(neck) etc. resulting in sthauya or ati Sthula. Chala sphika, chala udar, chala Stana and ati meda-mamsa vrddhi are very obvious in all the patients of sthauya. Manifestations of these Rupas are associated with either excessive accumulation of meda dhatu or diminished nourishment of other dhatus or obstruction in various Srotas(channels) by medojanya margavarodha or the aama or vitiation of vata and slesma Dosa, so excessive accumulation of Medo Dhatu produces various signs and symptoms in Sthauya patient. High intensity and severity of sthauya due to

ati ksudha (increased appetite) and ati pipasa (increased thirst) and manifestations of severe complications and even death due to its ignorance have been mentioned with example of Davanala by Charaka<sup>4</sup>.

Obesity occurs when a person consumes more calories from food than he or she burns. Obesity is caused by various series of factors like genetic factors carried by genes such as Leptin, LepR, POMC, MC4R and PC-1 and environmental factors such as life style, behavior, diet, physical activity, social factors like poverty and a lower level of education. Diseases like Hypothyroidism, Cushing syndrome, Polycystic ovarian

syndrome and Drugs like steroids, antidepressant can make a person obese. Pathophysiology of obesity seems simple: a chronic excess of nutrient intake relative to the level of energy expenditure<sup>5</sup>. Obesity has also been defined as body content greater than 25% of total body weight for male; greater than 30% for female. Obesity is defined as B.M.I. greater than 30 Kg/m<sup>2</sup>. A body weight 20% or more above desirable weight for age, sex and height is regarded as obese. 1.6% of new cancer cases in Indian women are due to high B.M.I. The international classification of overweight and obesity according to BMI as per WHO<sup>6</sup>.

CLASSIFICATION	BMI(KG/M2)
Normal range	18.50-24.99
Overweight	>25.00
Pre-obese	25.00-29.99
Obese	>30.00
Obese class 1	30.00-34.99
Obese class 2	35.00-39.99
Obese class 3	>40.00

$$\text{BMI} = \frac{\text{Actual weight in kg.}}{(\text{Height in meter})^2}$$

About 12% of the total body weight of a man consists of fat. The major part of it remains stored in the so-called fat depots, which includes subcutaneous tissue-50%, Peripheral tissue-15%, Mesentery tissue-20%, Omentum tissue-10% and Intramuscular connective tissue-5%. Depot fat is mainly composed of Triglyceride, cholesterol and little amount of polyunsaturated fatty acid<sup>7</sup>.

**Sthulata versus Krishta:-** It is easy for an obese person to lose up to 5 Kg. weight, but its maintenance and to achieve further weight loss is very difficult. Krichha sadhya (difficult to cure) nature of sthaulya has been described by most of the Ayurvedic classics. Bad prognosis of Sthaulya has been described by Acharya Charaka, because if they are not duly managed, they are prone to death due to excessive hunger (DAVANALA), thirst and other complications. He described that the gastric fire and the Vata are the special workers of havoc. They burn up the corpulent man, as the forest fire burns up the forest. The treatment of sthaulya is tedious work in comparison with treating krishna person. The aim of treating "Sthaulya" is at reducing vata, agni and meda. It is tedious work because, neither santarpana nor apatarpana mode of treatment is efficacious for correcting sthaulya; because samtarpana chikitsa pacifies vayu & agni; but at the same time raises meda dhatu. On the other side apatarpana chikitsa reduces meda on one hand but elevates the status of agni and vayu in the body. From above, it can be concluded that apatarpana dravyas with guruguna can produce the desired results. Also there is a very limited choice of drugs and diets for Sthula person and there is a greater probability of getting affected by complication. So, Vagbhata has considered Sthaulya as dushchikitsya vyadhi<sup>8</sup>. Short term treatment of

obesity is generally not warranted because obesity is a disorder that cannot be expected to remit/reduce without continued treatment and many of the times even though with best efforts many obese patients obstinately remained unchanged. The life expectancy of obese individual is much shorter than normal weights. Very roughly, it decreases by 1% below the normal for every ½ Kg weight above normal.

**Eight consequences of sthulata as described in Charak samhita<sup>3</sup>:**-Reduced life span, Laziness, Difficulty in sex, Weakness instead of having good weight, Smelling body and perspiration, increased appetite and thirst

**Measurement of obesity:-**

It is very easy to label a person as an obese, because in most of the cases it can be detected by visual inspection. However number of factors are needed to be considered to arrive at the conclusion, it can be assessed in several ways which are mentioned as follows: Weight and Height ratio

- ⊙ Measurement of skin-fold thickness
- ⊙ BMI
- ⊙ Circumference ratio (Waist/Hip ratio)
- ⊙ Density – Immersion – Plethysmograph
- ⊙ Potassium isotops
- ⊙ Conductivity
- ⊙ Bio-electrical impedance
- ⊙ Fat soluble gas
- ⊙ Ultra sound
- ⊙ Computed tomography etc.

The measurement of body circumferences with a measure tape provides the same advantages of portability, ease and acceptability as height-weight measurement.

Waist circumference is the minimum circumference between the costal margin and iliac crest, measurement in the horizontal plane, with the subject standing. Hip circumference is the maximum circumference in the horizontal plane, measured over the buttocks<sup>9</sup>. The ratio of the former to the later provides an index of the proportion of intra abdominal fat.

$$\text{W.H.R.} = \frac{\text{Waist circumference}}{\text{Hip circumference}}$$

The average value for men is 0.75 to 1.10 and for woman is 0.70 to 1.00.

Acharya Charaka has been described anthropometry of body, under the caption of Dashavidha Pariksha (Ch. Vi. 8/117). It may provide a relative measurement and objective criteria for patient of Sthaulya. Charak has mentioned Udara parinah (Abdominal circumference) 40 angula approx 30 inches and Shroni parinah (Hip circumference) 52 angula approx.39 inches.

**Factors influencing obesity:** - In spite of dietary intake and expenditure so many factors are responsible for obesity like emotional state, behaviour, life style etc. Expenditure of energy may occur by 3 ways<sup>10</sup>:

- A - Resting metabolic rate
- B - Thermogenesis
- C - Physical exertion

**Resting metabolic rate:**

Even while resting, the body needs many calories for its various functions. The metabolic rate is the energy required to maintain the normal processes of the body like breathing, digestion and heartbeat. B.M.R. of the males is slightly higher than the females. In women the resting metabolic rate is around 1400 calories, while it is about 1800 in men. It is inversely proportional to age. BMR increases in high altitude, due to increased surface area, due to hormones like thyroxine,

due to increase in temperature of body, due to some drugs and with certain diseases like hyperthyroidism, fever, cardio-renal disease with dyspnoea, leukemia, polycythemia, etc

$$B.M.R. = 0.75 (P.R. + 0.74 X P.P.) - 72$$

Where P.R. = Pulse rate, P.P. = Pulse pressure. The result comes out as the percentage of the normal and is correct within a range of + 10% viz. if above 10% the B.M.R. is higher, if below 10% it is lower than normal.

**Thermogenesis:**

In the resting condition, energy output above the B.M.R. is called thermogenesis. Diet, cold exposure, psychological influences and thermogenic agents are affecting factors which stimulate energy output. Thermic response to food is called dietary thermogenesis. About 75% of the thermic response to food is due to the energy cost of digestion, absorption, metabolism and storage of foodstuffs. The remainder is probably due to activation of the sympathetic nervous system

**Physical exertion:**

The energy expenditure of exercise is increased in obese compared with lean subjects due to extra efforts involved in moving or supporting an increased body mass. The obese individuals are relatively inactive because of their body mass and perhaps the greatest factor tending to diminish energy output is simply a sedentary life style.

**Diet regimen (pathya apathya) for obese<sup>11</sup>**

AHARA VARGA	PATHYA	APATHYA
Shuka Dhanya	Yava, Venuyava, kodrava, N nivar, Jurna	Godhuma, Navanna, Skhali
Shami Dhanya	Mudga, Rajmasha, K kulattha, Chanak, masur, Adhaki	Masha, Tila
Shaka Varga	Vruntak, Patrashaka, Patola	Madhurshaka, Kanda
Phala	Kapitha, Jamun, Amalak	Madhuraphala
Dravya	Takra, Madhu, Ushnodaka Til tail, Sarshap tail, Arishtha Asava, Jirnamadya	Dugdha, Ikshu Navnit, Ghrita Dadhi
Mamsa	Rohit Matsya	Anupa, Audaka Gramya

**Pathya – Apathya Vihara (Physical Regimen)**

PATHYA	APATHYA
<ul style="list-style-type: none"> <li>• Shrama</li> <li>• Jagarana</li> <li>• Nitya Bhramana</li> <li>• Ashwadi Rohana</li> <li>• Vyavaya</li> </ul>	<ul style="list-style-type: none"> <li>• Sheetal Jala Sevana</li> <li>• Divaswapa</li> <li>• Avyavaya</li> <li>• Avyayama</li> <li>• Ati Ashana</li> <li>• Sukha Shaiya Sevana</li> </ul>

**Pathya – Apathya Vihara (Mental Regimen)**

Pathya	Apathya
<ul style="list-style-type: none"> <li>• Chinta</li> <li>• Shoka</li> <li>• Krodha</li> </ul>	<ul style="list-style-type: none"> <li>• Nitya Harsha</li> <li>• Achinta</li> <li>• Manaso Nivriti</li> <li>• Priya Darshana</li> </ul>

Obese patient should consider following things:-

- Use of honey.
- Use of Spices-Fenugreek, turmeric, cumin, mustard, aseoetida curry leaves, ginger, black pepper, clove, cinnamon.

- Avoid sweet, sour, salty and oily food as it aggravates Kapha and Meda (Sweet foods include not only sugar but also rice, wheat, pasta, breads, and sweet milk products.)
- Cakes, cookies, Pastries, Chocolates.

- Dairy products especially cheese cream, ice cream, yogurt.
- Meat especially red meat ,fried food ,grilled food.
- Avoid packaged foods, processed food and restaurant fried foods - pizza, hot dog ,burger, doughnuts, French fries.
- Avoid leftover food.

#### **Avoid incompatible combinations of food**

- Milk with fish, meat, curd and sour fruits, bread containing yeast, cherries and yogurt
- Yogurt with milk, sour fruits, melons, hot drinks, meat, fish, mangos and with cheese
- Eggs with milk, meat, yogurt, melons, cheese, fish and bananas

#### **Avoid Tamasic food**

- Tamasic foods are those food items that make mind dull and creates inertia, laziness, disorientation and depression.
- Excess intake of fats oils sugars, heavy and left over food are Tamasic in nature.
- Foods that have been processed, canned or frozen food , Beef, fish, eggs, cold buffalo milk are also Tamasic.

#### **MANAGEMENT OF STHAULYA (OBESITY)**

Whatever is the ultimate cause of obesity in an individual case ,the immediate cause is energy imbalance, and weight reduction can be achieved only by reducing energy intake or by increasing output, or by a combination of the two. This involves change in the individual's way of life. Thus treatment is difficult and the patients need motivation. Rewards must be seen ahead and psychological understanding and behavioural advice are essential weapons.

The first line of the treatment for sthauya is to avoid those factors which are responsible for the causation of the disease. All these factors are having snigdha guna dominance in general. Nitya langhan therapy and langhana even in sisira ritu is advised for sthauya patients by Vagbhata<sup>8</sup> Ten types of Langhan therapy i.e Vamana Virechana, Asthapana Basti, Sirovirechana, Maruta Sevana, Vyayama, Upavasa, Pipasa Nigraha and Pachana are advised for practice according to Vyadhibala and Dehabala by Charaka<sup>3</sup>. Among Saptvidha Upakrama, Langhana and Ruksana therapy are more suitable for management of Sthauya. Langhana, the line of treatment for sthauya has been further divided into Samsodhana and Samsamana.

#### **Samshodhana:**

Atisthula patients with proper dosha and bala should be treated with samsodhana therapy, including Vamana, Virecana, Ruksa Niruha, Raktamoksana and sirovirecana<sup>12</sup> Being a syndromic condition (Bahudosyasa Lakshanam) samsodhana therapy is highly recommended for Sthauya patients possessing stamina and strength. Ruksa, Usna and Tikсна Basti are also suggested by Caraka.. Ruksa Udvartan is the bahya shodhan indicated for the management of sthauya. 'Snehana Karma is always restricted for the patients of Sthauya, however for external use Taila is recommended.

#### **Samana:**

Langhana and Ruksana can be administered for Samsamana purpose having Ruksa Guna dominance in them. Alleviation of Vata, Pitta and Kapha especially Saman Vayu, Pacaka pitta

and Kledaka kapha along with depletion of medodhatu by increasing medodhatvagni is main goal of treatment in Sthauya. Administration of guru and apatarpana articles which possess additional vata slesma and meda nasaka properties is considered as an ideal for samsamana therapy. Prag Bhakta i.e intake of medicine before meal is insisted for krsikarana purpose. It has been further elaborated by Sarangdhara and advised to take Lekhana drug on empty stomach in early morning and before meal<sup>13</sup>. Acharya Charaka has mentioned Lekhaniya dashemani Dravyas<sup>3</sup> – a group of 10 drugs, these drugs principally perform the Lekhana Karma of excess and abnormal Meda, causing weight reduction as well as relief in other signs and symptoms. These drugs are given below –

1. Mustaka
2. Kustha
3. Haridra
4. Vaca
5. Ativisha
6. Katu Rohini
7. Chitraka
8. Chirabilva
9. Daruharidra
10. Haimvati (Karanj)

Madhu has Guru and Ruksha properties; hence it is ideal one for management of Sthauya. Some samshamana yoga like Guduchi, Bhadra Musta, Triphala, Takrarista, Makshika, Vidangadi Lauha, Bilvadi panchmula and Shilajatu with Agnimantha svarasa are advised to practice for prolonged period .Some drugs and preparation like Karshana Yavagu of Lekhaniya Mahakashaya Venuyava, Bibhitaka and Madhudaka are advocated as Medanashaka and Lekhaniya. In Ashtanga Samgraha, Madanaphaladi churna, Kutajadi churna, Hingvadi churna and Vidangadi mantha etc. herbal yoga are mentioned. Krishna Lauha, Shankha and Samudraphena, Tuttha Manahshila and Shilajeeta are additional dhatu described as Lekhana and Medonashaka. Rasanjana is mentioned as the best for the treatment of Sthauya, while Guggulu is mentioned as the best for the disorder of Vata and Meda<sup>14</sup>. So, guggulu can be used for the treatment of Medavrita Vata condition.

In Ashtanga Hridaya, Gomutra Haritaki, Rodhrasava, Navaka guggulu, Amruta guggu, Vardhamana Bhallataka Rasayana etc. are the remedies added for the management of Sthauya.

Bhava Prakasha<sup>15</sup> has mentioned the remedies for Medohara purpose, Chavyadi Saktu , Triphaladya churna, Muli churna, Erandapatra Kshara, Badaripatra Peya, Amrutadi guggula, Dashanga guggul, Trashusnadi guggula, Loha Rasayana , Lauharishta etc.

#### **Common herbs that can be used**

##### **Triphala**

It is combination of 3 healings herb, their fruits are used.

Amalaki (Emblica officinalis),-

Haritaki (Terminalia chebula)

Bibhitaki (Terminalia belerica)

Effects of Triphala<sup>16</sup> - all dosha balancing, very good cleanser, purifies blood and a rejuvenating herb. It decreases excessive Meda, reduces serum cholesterol, reduces the plaque formation in the arteries, high blood pressure, provides

remarkable protection in CVD. In a study conducted by the American Botanical Council, it was shown that Triphala greatly reduced blood glucose levels in diabetic rats.

#### **Guggulu- (Commiphora mukul)**

- Useful part is Resin , Old guggulu- scraping quality.
- It is strong detoxifying & cleansing & rejuvenating herb.
- Lower cholesterol and triglycerides and maintain or improve HDL/LDL ratio, anti-inflammatory effects.

#### **Vidanga –Embelia ribes**

- Vata kapha pacifying, agni stimulating,
- Vidanga allays vata, it is diuretic, a mild purgative and kills worms, it is an appetizer, digestive , blood purifier and rejuvenator<sup>17</sup>.

#### **Shilajatu-Mineral pitch**

- Mainly Vata and Kapha balancing
- It decreases excessive fat, very helpful in enhancing sexual powers. It is anti inflammatory and antioxidant<sup>18</sup>

#### **Some common preparations used in obesity**

- Navak Guggulu
- Triphala Guggulu
- Amrutadya Guggulu
- Chandraprabhavati
- Mustadi Kwath
- Vidangadi Churna
- Anupan- luke warm water and honey

#### **Yoga Asana-**

- Suryanamaskar-(Sun Salutations.
- Pawan muktasana ( (Wind Liberating Pose)
- Utthanpadasana (Raised Leg Pose)
- Dvichakrikasan- (Bicycling)
- Padvruttasan- (Leg rotation)
- Naukasana (Boat Pose)
- Pranayama (breathing excersises) and Meditation<sup>19</sup>

#### **Useful tips**

- Maintain a regular daily routine. Wake up before 6.00am
- Take 2 teaspoon of honey and 2 tea spoon of lemon juice with 1 glass of warm water
- Exercise at morning at least 40 min/day -4days/week
- East light nourishing breakfast –cooked apple, toast cooked barley or oatmeal<sup>20</sup>
- Use spices and herbs that are suitable for you while cooking
- Boil water with fresh ginger and drink frequently throughout the day
- Make Lunch as a main meal. Dinner should be as light as possible.
- For dinner, eat light one-dish meals, or vegetable or lentil soups.
- Do not sleep during day
- Avoid eating late at night
- Eat only after digestion of previous meal.
- Eat only when you are hungry. Find out correct quantity for you<sup>21</sup>.
- Keep the regular timings of meal. Eat mindfully.
- Concentrate on your food, what you are eating. Don't divide your attention by reading, working or watching TV while you are eating.
- Take a walk after meal.

- Replace caffeinated and carbonated beverages with herb-spice teas.
- Fasting-One day fasting in a week is good

#### **According to Modern Science:**

obesity treatment includes following phases<sup>1</sup>–

- |                       |                      |
|-----------------------|----------------------|
| ◆ Patient Counselling | ◆ Exercise Therapy   |
| ◆ Behaviour Therapy   | ◆ Drug Therapy       |
| ◆ Dietary Management  | ◆ Surgical Treatment |

**Patient Counselling :** Patient counselling is the most important for the treatment of an obese person. Under this heading detail knowledge of the disease needs to be given to the obese person. An obese person should be explained about the cause and treatment of this disease and must emphasized to put on reduction of the fat instead of weight loss. The primary goal of the treatment is to lose body fat while maintaining muscle or lean body mass.

**Behaviour Therapy :** Behaviour therapy is a term, which covers wide variety of treatments at approaches and is based on an attempt to produce permanent changes in behaviour by involving the patients in his own management. The principles of behavior modification provide the underpinnings for many current programs of weight reduction. The basic principles are those of operant conditioning and cognitive restructuring<sup>22</sup>. Eating behavior is analysed into its antecedents, the act of eating and the co-sequences of eating by asking the patient to monitor and record these activities. The settings in which eating occurs, the eating even itself, at the use of rewards resigned to change maladaptive behaviors are all monitored. Attempts are made to change thinking patterns from negative once to positive ways for solving the problem. Features of behavior modification of proven value include: 1) continued monitoring of food related behaviors, 2) adoptions of a low-fat diet, and 3) increased level of physical activity.

**Dietary Management:** Diet plays an important role in the prevalence of obesity. The diet should provide 500 – 1000 kcal/day less than the maintenance energy requirements in order to achieve weight loss. So it is desirable to restrict intake of fat and particularly saturated fat, partly to reduce the risk of atheromatous heart disease. Increasing the frequency of eating is also a useful strategy. People who eat breakfast have a lower risk of developing obesity than individuals who do not<sup>23</sup>. Ingestion of frequent small meals with relatively high carbohydrate and high fiber content is a way of decreasing fat intake and providing continue gastrointestinal field. Moreover, the foods that are not restricted are fruits, vegetables and whole grain cereals, since these are important sources of micro-nutrients and non-starch polysaccharides. It is important that protein intake should be adequate to avoid unnecessary loss of lean tissues.

**Very-low-calorie diets(<400):** Commercial diets that provide the recommended daily amounts of micro-nutrients with minimal energy are attractive to patients wishing to lose weight rapidly. The disadvantage is that rapid weight loss may cause excessive loss of lean tissue.

**Drugs:** Drug in weight control has been used as short-term adjunctive therapy to diet and exercise. The long term use of drugs has been disappointing owing to less effect on weight

loss or adverse side effects. In general, drugs affect appetite modestly.

**i. Amphetamine and related compounds:**

a) Seems to produce anorexia through stimulating the central hypothalamic neurochemical pathways in which norepinephrine and / or dopamine is the principle neurotransmitter. Amphetamine not only decreases appetite, it also elevates mood increases arousal, probably mediated through making norepinephrine and dopamine more abundant at synapses<sup>1</sup>.

Dose: 5 mg. twice or thrice /day.

b) Fenfluramine, which increases release of serotonin in the brain, probably acts by stimulating satiety rather than inducing anorexia.

Dose: 20 mg twice a day gradually increased not more than 120 mg/day.

c) Dextroamphetamine - 2.5 mg to 5 mg /day.

d) Mazindol.

e) Phentamine

f) Diethylpropion

**Contraindication:** These drugs must not be given to a patient with a history of psychiatric illness.

**ii. Bulk anorexiant:**

a. Methycellulose: It is digestible when ingested ,it swells and adds to the bulk in the diet .Though it is used as a appetite satiator in the treatment of obesity it has proved no more effective , than the high residue low caloric diet.

b. Phenyl: Tert putylamine, in the form of a resin complex, is an anorectic agent used.

**iii. Miscellaneous:**

a) Thyroxine – The administration of thyroxine to euthyroid patients is not only useless but is potentially dangerous, especially if heart disease is present. It should be prescribed only if hypothyroidism co-exists with obesity.

b) Biguanides –(anti-diabetic drugs) metformin, phenofornin because of anorexic effect, reduction in carbohydrate absorption and hypoinsulinemic effect. It may produce serious hypoglycemia hence not used.

**Surgery:** Certain patients have severe obesity (greater than 100% of desirable weight) have tried weight control programmes without success and often have complications like sleep apnea, heart attack, phlebitis and arthritis, their life expectancy is much lower than normal. These patients may be candidates for surgery, since non - operative management rarely leads to permanent weight reduction.

a) **Jejuno-ileal bypass:** An end to anastomosis is constructed between the Jejunum (38 cm) and ileum (10 cm) at a point 10 cm. proximal to the caecum.

This intestinal bypass is now performed infrequently because of its high incidence of undesirable effects.

b) **Gastric – restruction operations:** a small fundic pouch or reservoir is created so that in the individual is severely limited in the amount of food that he or she can eat.

Surgery is still unsatisfactory and experimental because lifelong follow up and vitamin and mineral supplementation are necessary, but it may be advisable in some cases.

## CONCLUSION

Excessive indulgence in oily and fatty food, sedentary life style, Manasika factors along with genetic predisposition play a major role in aetiogenesis of Sthaulya. There is no specific treatment for obesity,only diet and exercise can play important part. Obesity occurs more in female than male and specially increases after use of IUCD, contraceptive pills, post delivery and in menopausal period. Moreover, as enumerated earlier, Meda as dushya, Kapha & Avrita Vata as dosha and Medodhatvagnimandya are main responsible factors in pathogenesis of Sthaulya. So that type of drug/therapy should be recommended which pacify these factors and it can be accomplished by combination of Tiktarasa(bitter)<sup>24</sup> pradhana drugs.

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Source of support: Nil, Conflict of interest: None Declared