

## A CONCEPTUAL STUDY ON THE AETIOGENESIS OF STHOULYA

Dr.Keziah Mary George<sup>1</sup> Dr.Smitha Bhat<sup>2</sup>

<sup>1</sup>Assistant Professor, Assistant Professor<sup>2</sup> Department of PG studies in Swasthavritta and Yoga, Alva's Ayurveda Medical College, Moodbidri, Karnataka, India

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### ABSTRACT

Evolution of modern civilization has made man more physically inactive. Sedentary lifestyle has increased due to the development of the science and technologies. All these factors have invited many diseases to man's life, one among them is obesity. Obesity occurs due to excessive intake of high calorie diet and physical inactivity. Obesity is compared with

Intake of *shleshma ahara*(unctuous food), *avyayama*(physical inactivity) and *divaswapna*(day sleep) are the main *nidana*(causes) of *sthoulya roga*(obesity). It can occur due to *beeja dosha* (hereditary factor) also. Knowing about the *nidana*(cause) and *samprapthi*(pathogenesis) of the disease is always important. Unless we know the *nidana* we cannot manage the condition *sthoulya*. This article is an effort to understand the *nidana*, *samprapthi*(pathogenesis) of *sthoulya* as well as the management of the condition.

**Key words:** *Sthoulya*(obesity), *Medo roga*(hyperlipidemia), Obesity.

### INTRODUCTION

*Sthoulya roga* (obesity) has become one of the main lifestyle disorder faced by the world today.<sup>1</sup> *Sthoulya roga* is explained in detail in various *Ayurveda* texts and *Acharya Charaka* considered it as a *santharpanottara vikara*, which is characterized by excess intake of food. Sedentary lifestyle and

excessive junk food habit has ended up man in various diseases, and obesity is one among them. Overweight and obesity are defined as abnormal or excessive fat accumulation that impair health.<sup>2</sup> It is one of the world's oldest lifestyle disorder and is widely regarded as a pandemic with a potential to bring

disastrous consequences for human health. WHO states, worldwide, obesity has tripled since 1975, and according to the reports of 2016 more than 39% of adults aged 18 years and over were overweight and 13% were obese.<sup>3</sup>

*Acharya Charaka* considers *Atisthoola*(over-obese) as one among the *Ashta Nindita Purusha* (eight despicable personalities) and defined it as a condition of excessive accumulation of *Medas*(fatty tissue) and *Mamsa*(muscle), leading to flabbiness of *sphik* (hips), *udara* (abdomen) and *sthana* (breast).<sup>4</sup> *Sthoulya* is told as a *bahudoshaja*<sup>5</sup>, *medopradoshaja*<sup>6</sup> and *sleshmaja nanatmaja vikara*<sup>7</sup>. It occurs due to *atibruhmana* (over nourishment) of the *shareera*.<sup>8</sup>

#### **MATERIALS AND METHODS:**

##### **MATERIALS:**

This article is based on the review of literature from relevant Ayurvedic, modern and contemporary literary sources including the web sources,

different journals and articles about the topic *Sthoulya* (obesity).

##### **STHOULYA NIDANA**

Madhava Nidana states *Avyayama* (not doing exercise), *Divaswapna* (day sleep) and *Sleshma Ahara Sevana* (unctuous food intake) as main nidanas of *Sthoulya*. For easy understanding, the nidanas of *sthoulya* can be divided to *Aharajanidana*, *Viharajanidana*, *Manasikanidana* and *Bijadoshaswabhava*.<sup>9</sup>

*Aharaja nidanas* which includes intake of *sleshmakara*(unctuous food), *madhura anna rasa* (foods having sweet tastes), *adhyashana* (eating when the previous food is not digested), *atisampoorana*(over nourishment) excessive intake of *guru ahara* (heavy), *sheetha ahara*(cold), *snigdha ahara*(unctuous) *pichila ahara*(slimy), *nava anna*(newly harvested rice), *nava madhya* (fresh wine), *anupa* and *varija mamsa* (marshy and aquatic animals), *gorasa* (cows milk), *goudika anna*(sugar candy preparations), *paishtika atimatra*(pastries).<sup>10</sup>

**Table 01: Apathya Ahara in sthoulya<sup>11,12</sup>**

VARGA	AHARADRAVYA	ENGLISH NAME
Ahara varga	Navanna	Freshly harvested rice
	Masha	Black gram
	Taila	oil
Jala varga	Dushitha jala	Polluted water
	Sheetha jala	Cold water
Madya varga	Nutanya madya	New wine
Kanda varga	Aluka	Potato
Ksheera varga	Dadhi	Curd
	Ksheera	Milk
	Guda	Jaggery
Mamsa varga	Anupa mamsa	Marshy animals

**Table 02: Viharaja & manasika nidana of Sthoulya**

VIHARAJA NIDANA	ENGLISH NAME
Avyayama	Not doing exercises
Avyavaya	Abstinence from sexual desire
Chestadvashi	Averse to physical exertion
Divaswapna	Sleep during daytime
Shayyasana sukha	Keep lying on bed or sitting all the time

MANASIKA NIDANA	ENGLISH NAME
Harsha nityatva	Uninterrupted happiness
Achintanath	Lack of mental exercises

## AHARAJA NIDANA

### Guru Atisevana

The *guru ahara sevana* causes heaviness in the body. It has *sheethaveerya* and is *guru paki*, affects the *jatharagni* (digestive fire) by diminishing the *agni* due to its *gurutva* (heaviness). It increases the *dhathu* and gives *bruhmana* (nourishment) and *shakthi* (strength) to the *shareera*. *Guru guna* is formed by *prithvi mahabhutha*, so it acts as *kaphakaraka* (increases the *kapha dosha*). Continuous intake of *guru ahara* can cause increase in the *medo dhatu*, thus leading to *sthoullya*.

### Madhura Ati Sevana:

*Madhura rasa* is formed by the combination of *prithvi* and *jala mahabhutha*, so it acts as *kaphavardhaka* (since *kaphadosha* consists of *prithvi* and *jala*). It has *guru*, *sheetha* and *snigdha guna*. As the *svadu rasa* is *satmya* (attuned to the body) it can nourish all the *dhathus*. Excess indulgence of *madhura rasa ahara* (*madhura ati sevana*) causes *alasya* (laziness), *gaurava* (heaviness) and over nourishment of all *dhathus* and thus can lead to *sthoullya* due to increase in *medodhatu*.

### Sheetha Ahara Sevana:

*Sheetha ahara* usually have *guru*, *mridu*, *sthula*, *manda*, *sthira* and *stambhanakara* qualities. This *guna* is mainly formed by *apya mahabhutha*. It is *vatakaphahara*. It causes *hladana* (pleasure of mind), for which people may have more tendency to eat food. It is *dhatuwardaka*. Continuous use of this *sheethaahara* increases the *kapha Dosha* and *medodhatu*.

### Snigdha Ahara Sevana:

*Guru*, *mridu*, *kledana* and *picchila* are the qualities of *snigdha ahara* i.e. ghee milk curd etc. *Snigdha guna* is mainly *jala mahabhutha*. It acts as *sleshmavardhaka*. It is *balakara*, increases the *dhatus* and acts as *vajikara*. Excess consumption of *snigdha ahara* increases *kapha dosha*. It also affects *medodhatu* due to its equalant property.

### Picchila Ahara Sevana:

The *picchila guna* has *guru*, *manda*, *mridu*, *sthula*, *sthira* and *slakshna gunas*, its mainly of *apya mahabhutha* and it is *kaphavardhaka*. It acts as *jeevaniya*, *balya* and *sandhanakara*. *Anupamamsa*, *curd*, *tila* etc. having *picchila guna* if taken in excess, increases *kapha dosa* and *medodhatu* due to its properties.

**Atibhojana:**

Excessive eating may aggravate all *doshas*. *Medovardhana* occurs when *bhojana* is taken in excess. This accumulated *medas* obstructs the *srotases*, preventing the normal movements of *vata dosha*. The *vayu* which is confined to *koshta* increases the *agni*, again causing more hunger.

**Navanna Sevana:**

Freshly harvested rice has *abhishyandi guna*. Continuous intake of *navanna* causes *kapha* aggravation, ultimately *medas* which is being increased leads to *sthoulya*.

**Navamadya:**

Freshly prepared wine (*navamadya*) is *guru* in nature. Excessive and continuous intake of *navamadya* can lead to increase in *kapha dosha* due to its properties like *gurutwa* and *abhishyandi*. *Acharya Charaka* has mentioned *navamadya* as a cause of *sthoulya*.

**Mamsa anupavarija:**

*Anupamamsa* are *guru, snigdha, madhura* and *vajikara* in nature. If a person takes it continuously, it causes *kaphavridhi* and *medodhatu atisanchaya* thus leading to *sthoulya*.

**Gorasa:**

Milk has the quality of *sheetha, mrudu, snigdha, bahala, slakshna* and *guru guna*. Curd is *abhishyandi, snigdha* and *kaphavardhaka*. Ghee is *soumya, alpaabhishyandi, snigdha, guru* and *medovardhaka*. Continuous intake of these products can cause *kapha* and *medovardhana*.

**Goudikaanna (sugar candy preparation) and paushtikaatimatra (pastries):**

These are *madhura rasa, snigdha, guru guna pradhana*. As explained earlier, *goudikanna* and *paushtika* with these properties can lead to *sthoulya* if taken in excess quantity.

**Adhyasana:**

*Acharya Sushruta* considered *adhyashana* (taking food before the digestion of previous food) as one among the cause for *Sthoulya*. Taking food before the digestion of the previous food causes aggravation of *kapha dosha* leading to *medo dhatu vardhana*

**Sleshmahara Sevana:**

*Sleshmaguna ahara* are having *kaphavardhaka* action. It has *picchila* and *guru guna*. If *sleshma ahara Sevana* is done excessively, it causes *medo vrudhi*.<sup>10</sup>

## VIHARAJA NIDANA

### **Avyavaya:**

*Avyayama* means lack of sexual indulgence. Due to lack of *vyavaya* (sexual intercourse), the *shukra dhatu* gets lodged. The increased *shukra dhatu* may lead to *srothorodha* (obstruction of channels). If *avyavaya* is prolonged with the other *nidanas*, it may lead to increase in *medo dhatu*.

### **Avyayama:**

*Vyayama* (physical exercise) is very essential for maintaining the health. *Acharya Vagbhatta* has considered *vyayama* as the activity that produces lightness in the body and brings *medo kshaya* and *ayu vardhana*. *Acharya Sushrutha* and *Madhava* explained *avyayama* as one of the *nidanas* of *sthoulya*. person indulging in all *aharaja nidana*, without doing *vyayama* causes accumulation of *medo dhatu* in the *shareera*. This leads to *Sthoulya*.

### **Diva swapna:**

*Nidra* is considered as one among the *trayopasthambha*. Though *nidra* gives *bala* to the *shareera*, if it is done in excess it may have its complications. *Diva swapna* (day sleep) increases *kapha dosha*. If *diva swapna* is practiced continuously it causes

*srothorodha* due to aggravation of *kapha dosha*. As a result it affects *medo dhatu* and may lead to *sthoulya*.

### **Shayyasukha:**

Happy and comfortable *shayya* (lying down) and *asana* (sitting) for long time with continuous indulgence of *guru snigdha madhura sheeta ahara*, without doing *vyayama* may cause *kaphavridhi*. Later on, it affects *medo dhatu* due to its similar property with *kapha dosha*.

### **Achintha:**

Restraining thoughts is considered as *achintha*. *Acharyas* have said that *chintha* will lead to aggravation of *vata dosha* and *achintha* leads to increase in *kapha dosha* which leads to *medho dhatu vridhi* leading to *sthoulya*.

### **Nityaharsha:**

*Nityaharsha*, that means continuous joy. If the person feels always happy then he takes more diet due to his happiness which in-turn will cause increase in *kapha* and *medho dosha* which leads to *sthoulya*.<sup>13,14,15</sup>

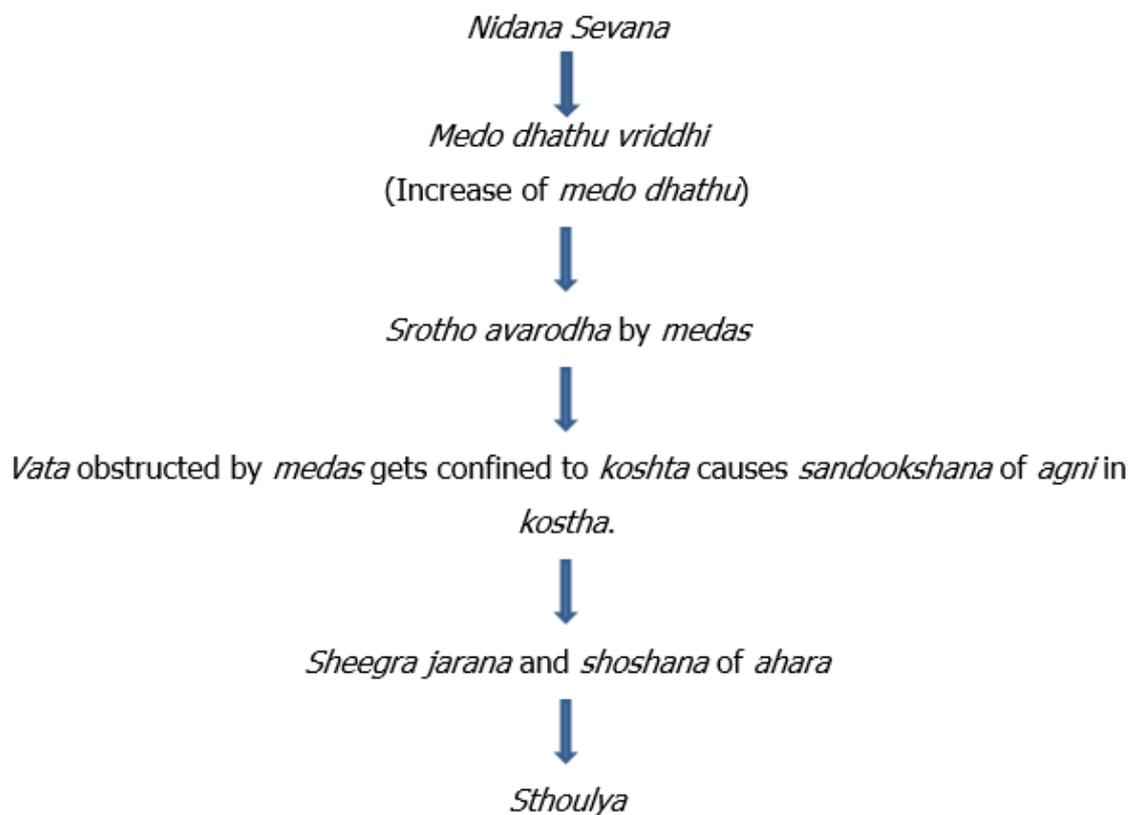
## STHOULYA SAMPRAPTI

Due to *nidana sevana* like *adhyashana*, *atisampoorana* etc *medas*(fat) gets accumulated more in the *shareera*(body). This *medas* blocks the *srotas*(channels), as a result, *vayu* will

be obstructed from its normal movement and confined only to *koshta*. Vata Dosha is aggravated in the *Koshta* due to the obstruction of *Srotas* by *Medas*. This *vayu* increases the digestive fire (*agni prajwalana*) which further lead to more hunger (*kshut*). It makes the food digest fast so the person will have more tendency to consume food frequently. If the person delays to take the food, excessive *agni* produced can affect the

*dhathus* which may lead to other disorders too.<sup>16</sup>

Due to the obstruction of the *strotas*(channels) only the *dhathus* till *medas* will be nourished and other *dhathus* remain unnourished. Acharya Charaka has given a simile as, how a forest fire can burn the whole forest, likewise here *vayu* and *agni* has the power to cause complications (*upadrava*).



According to Susruta, the *Ama Rasa* which is produced by the *Nidanas* will acquire *Madhuratwa* along with the *Snehamsha* present in the body producing *Vikrutha Medas* leading to *Meda Vriddhi*.

### STHOULYA POORVARUPA

*Poorvarupa* happens usually during the fourth *Kriya Kala* called as "*Sthana Samshraya*". The mild exhibition of the actual features of the disease will be seen in here.

It is of two types:

1. *Samanya Poorvarupa*
2. *Vishesha Poorvarupa*

In the context of *Sthoulya*, it is difficult to identify the features of *Poorvarupa* as Acharyas have not stressed upon them. So the symptoms that initially manifest like *Atinidra, Tandra, Alasya, Visra, Shariragandha, Angagaurava, Shaithilya* etc can be considered as the premonitory symptoms or the *Poorvarupas* of *Sthoulya*.<sup>17</sup>

### STHOULYA LAKSHANA

*Medo mamsa athivridhi* will be there in *chala, sphik, udara* and *sthana* with *ayathopachaya* (disappropriate growth of fat) and *utsaha* (enthusiasm)

The *lakshanas* of *sthoulya* is explained as *ayushohras* (diminution of lifespan), *javoparodha* (lack of enthusiasm), *krichravayavayatha* (sexual act difficulties), *dourbalya* (weakness), *dourgandhya* (foul smell), *svedabadha* (excessive sweating), *ksudh atimatratha* (excessive hunger), *pipasa*

*atiyoga* (excessive thirst) are the *astha doshas* mentioned by Acharya Charaka, *shithilya* (impaired bodily movements due to looseness), *gurutvat medasa* (heaviness due to fat), *saukaumarya* (tenderness), *sweda* (sweat) will be more. *Tikshnagni* (sharp digestive power) *vyayama asahatva* (exercise intolerance).<sup>17</sup>

*Ashakthu sarvakarma* (not able to work), *kshudra swasa* (dyspnea) *trisha* (thirst), *moha* (confusion), *swapna* (excess sleep) *kradhana* (snoring), *sadana* (exhaustion), *alpa prana* (less lifespan), *alpa maiduna* are the other *lakshanas* given by *Madhava nidana*.<sup>18</sup>

### BHEDA OF STHOULYA

Based on severity and chronicity, *sthoulya* is classified which will help for the easy diagnosis, prognosis and management. *Sthoulya* is classified into three in the context of indication of *Langana, Upakrama*, they are:

- *Hina Sthoulya*
- *Madhyama Sthoulya*
- *Ati Sthoulya*

*Sthoulya* when there is presence of certain conditions with more vitiation of *pitta* and *kapha dosha* is told as *adhi sthoulya*, with moderate vitiation *pitta* and *kapha* as *madhya sthoulya*

and less vitiation of *pitta* and *kapha* as *hina sthoulya*.<sup>19</sup>The most commonly used measure for obesity and overweight is the Body Mass Index. These BMI values are same for both the sexes and for all ages of adults. BMI helps to classify overweight and obesity in adults.

### **OBESITY CAUSES**

Obesity is mostly primary, and no obvious cause exist other than imbalance in energy intake and energy expenditure. When energy expenditure is less than energy intake, there will be weight gain. The marked increase in the intake of energy dense food that are high in fat and physical inactivity due to increased sedentary lifestyle are the main causes of obesity. Obesity can occur at any age, but now it appears to be more in adolescent age due to their unhealthy eating habits. The training they get in early childhood and other social factors influence eating habits. From infancy to adolescence if they are having excessive weight gain, then there is an increased chance of getting obesity in their later life's too.<sup>20</sup>

According to the studies by WHO, overweight and obesity is found more in women than men. It may be due to

hormonal imbalance that occurs during pregnancy and menopause.

**Physical Inactivity:** There is convincing evidence that regular physical activity is protective against unhealthy weight gain. Whereas as sedentary lifestyle particularly sedentary occupation and inactive recreation such as watching television promote it, physical activity and physical fitness are important modifiers of morbidity and mortality related to overweight and obesity.

**Race:** In Muslim community obesity is said to be very high due to their excessive consumption of fatty food.

**Socio-economic condition:** There is a clear direct relationship between socio-economic status and obesity. In developing countries obesity is more seen in higher socio economic groups whereas in developed countries this disease is more seen in lower socio economic people.

**Urbanization:** The increased energy intake and decreased energy output of urban population leads to obesity.

**Eating Habits:** Habits like eating in between meals, more preference and intake of sweets, refined foods and fats can lead to obesity. The composition of the diet, the periodicity

with which it is consumed and the amount of energy derived from it are all relevant to the aetiology of obesity.

**Psychosocial Factors:** Over eating might be a symptom of depression, anxiety, frustration and loneliness. Emotional disturbances are deeply involved in the aetiology of obesity.

**Familial Tendency:** Obesity frequently runs in the families. Obese parents frequently have obese children.

**Alcohol and Smoking:** Drinking alcohol has shown to cause more intense cravings for food. After drinking, people may eat more food. Alcohol intoxication can change someone's perception of appetite.

Hereditary factors, endocrine factors (Cushing's syndrome, hypothyroidism etc. are the other causes of obesity.<sup>21</sup>

### **OBESITY CLINICAL FEATURES**

Increase in body weight 10-20% above the normal. Distribution of fat may be android (abdomen and shoulder predominantly) or gynoid (hips, buttocks, thighs, breast, arm and face predominantly). Other common causes include exertional

dyspnea, sluggishness, angina and arthralgias of knees and hips. Obesity leads to impairment of carbohydrate intolerance, elevation of cholesterol level in blood and mild elevation of blood pressure. The obese subjects have to spend more energy for the same amount of work done by subjects with normal BMI.<sup>22</sup>

### **OBESITY HAZARDS**

Obesity is associated with significant increase in both morbidity and mortality. Endocrinal and metabolic disorders like hyperinsulinemia, type 2 diabetes mellitus etc, cardiovascular diseases like hypertension, coronary heart disease, hypercholesterolemia etc , pulmonary diseases like exertional dyspnea, recurrent bronchitis etc, psychological abnormalities like depression (due to unattractive physical appearance), musculoskeletal disorders like gout, osteoarthritis, other complications like neural tube defect, perinatal mortality etc are few health consequences of obesity.<sup>23</sup>

**Table 03: Sthoulya pathya ahara<sup>24,25,26</sup>**

VARGA	AHARA DRAVYA	ENGLISH NAME
Anna	Purana shali	Old variety rice
	Raktha shali	Red variety rice
	Shashtika shali	Rice harvested in 60 days
	Yava	barley
Jala varga	Chanaka	Bengal gram
	Kulatha	Horse gram
	Shrutha sheetha jala	Lukewarm water
	Shunthi siddha jala	Ginger water
Madya varga	Madhu	honey
	Panchakolasritha jala	Water with panchakola
	Purana sidhu	Old wine
Kanda varga	lasuna	garlic
	ardraka	Wet ginger
	sunthi	Dry ginger

VARGA	AHARA DRAVYA	ENGLISH NAME
Mutra varga	gomutra	Cows urine
Ksheera varga	takra	buttermilk
Shakha varga	Patola	bottleguard
	Karavellaka	bittergaurd
	Varthaka	brinjal
	Nimba pathra	Neem leaves
	shigru	drumstick
Mamsa varga	Jangala mamsa	Dry land meat

### MANAGEMENT OF OBESITY

Maintenance of body weight is very essential. Weight reduction can only be achieved by reducing the energy intake or by increasing the output. Initially motivation should be given to them and it is most important that the patient should be educated and given awareness regarding their condition.

The main goals of management should be to prevent further weight gain, to achieve weight loss and to maintain low body weight.

DIET: A low calorie diet which is nutritionally adequate should be framed to induce weight reduction. According to the weight of the patient we have to plan a diet chart restricting

the protein, fat and carbohydrate intake. Emphasis should be greater on intake of fruits, vegetables and fibre rich food. Crash diet given for a few days will be ineffective because of the long term requirement. So long term diet charts must be prepared.

**EXERCISE:** Exercise is the most important component of weight maintenance. Obese person always tends to remain inactive. So it is important to increase the activity and thus the overall energy expenditure. At least 30 minutes of moderate intensity physical exercise must be recommended on all days of a week. Exercise should be initiated slowly, and then its intensity must be increased gradually. More motivation must be given to the obese patients since they are not habituated to exercises.

**BEHAVIOURAL THERAPY:**

A set of principles and techniques must be designed to modify the eating and physical exercise activities of the obese. Many people have little knowledge of how much they eat and about its calorie content. They must be made aware of how their food habits leads to obesity. New modes of eating habits are suggested for the patient, which includes the quantity, how many

times they should eat and what they should eat. Behavioural therapy also includes physical activities.<sup>27</sup>

### **YOGASANAS FOR STHOULYA**

Surya namaskara, Sarvangasana, Halasana, Chakrasana, Bhujangasana, Dhanurasana, Shalabhasana, Padahastasana, Ardhakatichakrasana<sup>28</sup>

### **DISCUSSION**

Ahara and vihara plays a vital role in the *swasthya rakshana* of a person. *Ahara* can become a cause of health as well as ill health. By giving importance to *ahara*, Ayurveda explains *Sthoulya* as a *santarpanotta vikara*. It is caused by the aggravated *Kapha dosha*. Continuous indulgence with the *nidana* leads to the aggravation of *Kapha dosha* and *Medo dhatu* due to its similar properties. In the beginning *agni* becomes *manda* due to the excessive intake of *sleshma bahula ahara*, after that the increased *Medas* obstructs the *Srotas* and the *Vata* which is moving in *Koshta* becomes hyper active which stimulates the *agni* where the person ends up in eating more. It affects directly the *medo dhatu* and not the others as the etiological factors are equivalent to the *medo dhatu* and also the *kha vaigunya* is in the *medovaha srotas*. The

concept of *agni* is necessary to understand the formation and vitiation of *medo dhatu*. The capacity to digest the *medamsa* by the *medodhatwagni* is hampered; *medodhatwagni mandhya* takes place leading to the formation of *apakwa meda* which is incapable of nourishing the *uttara dhatu* too.

Both *ahara* and *vihara nidanas* mentioned by the Acharyas causes *medovridhi* which in turn leads to the condition called *sthoullya*. *Nidana parivarjana* is the main line of treatment modality. The simplest form is to avoid the causative factors, which are responsible for the disease and it is the primary step to prevent further pathogenesis. Thorough understanding of the *nidana* is needed in framing a right protocol and following a wholesome part of life. General rule in *Swasthavrittapanam* is to adopt the food and lifestyle opposite to ones *Prakruthi*.

The improper diet habits and lack of physical activity has increased dramatically today and it enhances the risk of obesity to a greater extend too. Since obesity has a potential to bring many consequences to human health we must consider it as a serious health

issue. Hence prevention of obesity is very essential and it should be done through various lifestyle modifications which include dietary changes and physical activities.

The primordial prevention should aim at the general education about the different aspects of the disease including its causes, complications, prevention and control of obesity. After obtaining historical information about age of onset, family history, eating and exercise habits, alcohol use, psychological factors etc. we should give a proper counselling and bring about certain behavioural modifications in them. Motivation for weight reduction must be cultivated in the patients mind. An ideal weight reducing diet must be given which are nutritionally adequate and deficient in calories. Regular exercising habits should be maintained by the person. The secondary prevention can be implemented to prevent the further stages of obesity which has already manifested.

### **CONCLUSION**

Obesity has become a global epidemic which is threatening people with its serious complications. It is mainly due to the junk food meals with high

calorie and sedentary lifestyle which makes them unhealthy. It is very essential to know about the causes of obesity and avoid them and follow a healthy lifestyle. By adopting Ayurveda, following proper regimens, *pathya aharavihara* and *yoga* we can manage this condition and improve the quality of life and thus we can prevent the complications too. Weight gain must be controlled before the adolescence so that we can avoid it in adults. Education must be given and effective dietary patterns and physical exercises must be imposed for the people.

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**Corresponding author:**

**Dr. Keziah Mary George**

Department of PG studies in Swasthavritta and Yoga, Alva's Ayurveda Medical College, Moodbidri, Karnataka, India

**E-mail:** [keziahmarygeorge06@gmail.com](mailto:keziahmarygeorge06@gmail.com)

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