A CONCEPTUAL STUDY ON THE AETOPATHOGENESIS OF STHOULYA

Dr. Keziah Mary George¹ Dr. Smitha Bhat²

¹Assistant Professor, Assistant Professor ² 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 nidanas (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.¹ Sthoulya roga is explained in detail in various Ayurveda texts and Acharya Charaka considered it as a santharanottara 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.² 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.\(^3\)

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).\(^4\)

Sthoulya is told as a bahudoshaja\(^5\), medopradoshaja\(^6\) and sleshmaja nanatmaja vikara\(^7\). It occurs due to atibruhmana (over nourishment) of the shareera.\(^8\)

**STHOULYA NIDANA**

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

Aharaja nidanas which includes intake of sleshmakara (unctous food), madhura anna rasa (foods having sweet tastes), adhyashana (eating when the previous food is not digested), atisampoorna (over nourishment) excessive intake of guru ahara (heavy), sheetha ahara (cold), snigdha ahara (unctous) 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).\(^10\)
Table 01: Apathya Ahara in sthoulya\cite{11,12}

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

Table 02: Viharaja & manasika nidana of Sthoulya

<table>
<thead>
<tr>
<th>VIHARAJA NIDANA</th>
<th>ENGLISH NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avyyayama</td>
<td>Not doing exercises</td>
</tr>
<tr>
<td>Avyyavaya</td>
<td>Abstinence from sexual desire</td>
</tr>
<tr>
<td>Chestadveshi</td>
<td>Averse to physical exertion</td>
</tr>
<tr>
<td>Divaswapna</td>
<td>Sleep during daytime</td>
</tr>
<tr>
<td>Shayyasana sukha</td>
<td>Keep lying on bed or sitting all the time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MANASIKA NIDANA</th>
<th>ENGLISH NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harsha nityatva</td>
<td>Uninterrupted happiness</td>
</tr>
<tr>
<td>Achintanath</td>
<td>Lack of mental exercises</td>
</tr>
</tbody>
</table>
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 (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 medodhatu, thus leading to sthoulya.

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 sthoulya 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 dhatuvardaka. 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 mahabhuta. 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 abhisyandiguna. 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 due to its properties like gurutwa and abhisyandini. 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 kaphavriddhi and medodhatu atisanchaya thus leading to sthoulya.

Gorasa:
Milk has the quality of sheetha, mrudu, snigdha, bahala, slakshna and guru guna. Curd is abhisyandini, snigdha and kaphavardhaka. Ghee is soumya, alpaabhisyandini, 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 Sushrutha 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.10
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 mong 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.

Shayyasyasukha:

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 achinthana. 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.

Nithyaharsha:

Nithyaharsha, 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.\textsuperscript{13,14,15}

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 kostha. 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.16

Due to the obstruction of the srotas (channels) only the dhathus till medas will be nourished and other dhathus remain unnnourished. 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 Susrutha, 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 Vriddi.
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, Shathilya etc can be considered as the premonitory symptoms or the Poorvarupas of Sthoulya.

STHOULYA LAKSHANA

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

The lakshanas of sthoulya is explained as ayushohras (diminution of lifespan), javoporodha (lack of enthusiasm), krichravyayatha (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. Tikshnagi (sharp digestive power) vyayama asahatva (exercise intolerance).

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.

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*. 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.

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.21

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 mid elevation of blood pressure. The obese subjects have to spend more energy for the same amount of work done by subjects with normal BMI.22

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.23
Table 03: Sthoulya pathya ahara$^{24,25,26}$

<table>
<thead>
<tr>
<th>VARGA</th>
<th>AHARA DRAVYA</th>
<th>ENGLISH NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anna</td>
<td>Purana shali</td>
<td>Old variety rice</td>
</tr>
<tr>
<td></td>
<td>Raktha shali</td>
<td>Red variety rice</td>
</tr>
<tr>
<td></td>
<td>Shashtika shali</td>
<td>Rice harvested in 60 days</td>
</tr>
<tr>
<td></td>
<td>Yava</td>
<td>barley</td>
</tr>
<tr>
<td></td>
<td>Chanaka</td>
<td>Bengal gram</td>
</tr>
<tr>
<td></td>
<td>Kulatha</td>
<td>Horse gram</td>
</tr>
<tr>
<td>Jala varga</td>
<td>Shrutha sheetha jala</td>
<td>Lukewarm water</td>
</tr>
<tr>
<td></td>
<td>Shunthi siddha jala</td>
<td>Ginger water</td>
</tr>
<tr>
<td></td>
<td>Madhu</td>
<td>honey</td>
</tr>
<tr>
<td></td>
<td>Panchakolasritha jala</td>
<td>Water with panchakola</td>
</tr>
<tr>
<td>Madya varga</td>
<td>Purana sidhu</td>
<td>Old wine</td>
</tr>
<tr>
<td>Kanda varga</td>
<td>lasuna</td>
<td>garlic</td>
</tr>
<tr>
<td></td>
<td>ardraka</td>
<td>Wet ginger</td>
</tr>
<tr>
<td></td>
<td>sunthi</td>
<td>Dry ginger</td>
</tr>
<tr>
<td>Mutra varga</td>
<td>gomutra</td>
<td>Cows urine</td>
</tr>
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<td>Ksheera varga</td>
<td>takra</td>
<td>buttermilk</td>
</tr>
<tr>
<td>Shakha varga</td>
<td>Patola</td>
<td>bottleguard</td>
</tr>
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<td>Karavellaka</td>
<td>bittergourd</td>
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<td></td>
<td>Varthaka</td>
<td>brinjal</td>
</tr>
<tr>
<td></td>
<td>Nimba pathra</td>
<td>Neem leaves</td>
</tr>
<tr>
<td></td>
<td>shigru</td>
<td>drumstick</td>
</tr>
<tr>
<td>Mamsa varga</td>
<td>Jangala mamsa</td>
<td>Dry land meat</td>
</tr>
</tbody>
</table>

**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. Atleast 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.

YOGASANAS FOR STHOULYA
Surya namaskara, Sarvangasana, Halasana, Chakrasana, Bhujangasana, Dhanurasana, Shalabhasana, Padahastasana, Ardhakatichakrasana

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 santaranpanotta vikara. It is caused by the aggravated Kapha dosha. Continuous indulge 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
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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 *sthoulya*. *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 *Swasthavruttapalanam* 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

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