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Review Article

Non-Pharmacological Approach in the Management of Obesity (*Sthaulya*)

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Abstract: Obesity has reached epidemic proportions in India in the 21st century, with morbid obesity affecting 5% of the country's population. It is caused by the combination of excessive food energy intake, lack of physical activity, genetic susceptibility, endocrine disorders, medications or psychiatric illness. Obesity affects adversely on health, and reduced life expectancy of the individual. Despite of continuing efforts to find solutions it has reached epidemic proportions in many countries. A similar type of disease described in *Ayurveda* is *sthulya roga*, which is due to disorder of *meda* and *kaphaja dosha*. Various type of dietary articles like barley, old rice, oat, Bengal gram etc. mention in Ayurveda, which reduce the kapha and meda. Low energy food article with huge amount of fiber are effective in the management of obesity. Many researches proved that fruits and vegetables with anti-inflammatory phytochemicals can counteract obesity. Practiced of various Yogic techniques can be effectively to reduce the weight and achieve normal health of the body and mind. Therefore non-pharmacological approach likes diet and yogic practices like *asana, pranayama* and meditation have great hope for the management of obesity.
Keywords: *Asana*, Diet, Meditation, Obesity, *Pranayama*

INTRODUCTION

Obesity is most common metabolic disorder in the societies, which results from excess fat accumulates in the body. It is not a single disorder but, a heterogeneous group of conditions with multiple causes [**1]**. Major causes of the increasing prevalence of obesity include behavioural and environmental factors, such as excessive consumption of energy-dense foods and a sedentary lifestyle [2]. A person is considered as obese when his or her weight is 20% over the normal body-weight for height and age, and the Body Mass Index (BMI) measures 30 or more. However, it is not a single disorder but a heterogeneous group of conditions with multiple causes. A global epidemic of obesity and chronic diseases, which is underestimated if one uses the body mass index (BMI) alone, is spanning the globe as industrialization and improved standards of living are spreading to urban centres [3]. Some ethnic groups are genetically susceptible to metabolic syndrome due to the accumulation of visceral fat that results in inflammation in the absence of marked increase in BMI. It is estimated that within the next 10 years, the majority of all heart diseases and type2 diabetes cases will be associated with obesity. Obesity was rare before the some decades; in 1997 the WHO formally recognized obesity as a global epidemic [4]. WHO estimates that at least 500 million adults are obese in 2008, with higher rates among women than men, and the rate of obesity also increases with age. In the puberty phase and adolescent, hormonal changes causes more fat accumulates in body particularly in females so women are more prone to be obese than men. The persons of developed countries are more suffer than developing countries. These increases have been felt most frequently in urban areas, where the more convenient foods such as biscuits, bread etc. are the preparations of fat and sugar. Along with this the urban population also reduces the need for physical exercise, thereby increased energy intake and decreased energy output leads to obesity. Obesity is well defined in *Ayurveda* by ancient scholars as *Sthaulya* and *Atisthaulya* [5]. In this context *Acharya Sushruta* also mentioned at *Madhyama Sharira* [6] is best but *Ati sthula* and *Ati krisha* are always affected with some disease condition. As per *Ayurveda Acharya Charaka* counted *Sthaulya* under the eight verity of impediments which is designated as a *nindita purusha* [7]. *Sthaulya* is notorious disease which disturbs the total metabolic system of the body [5]. For the public health, obesity (*sthaulya*) must take into consideration the non-pharmacological approach for control of obesity

(*sthulya*), including balance diet, *yogasana*, *pranayama*, meditation etc.

CAUSES OF OBESITY

Obesity is most commonly caused due to the combination of excessive food energy intake, and lack of physical activity. A limited number of cases are primarily due to genetics, medical reasons, or psychiatric illness. In contrast, increasing rates of obesity in the community are felt to be due to an easily accessible and palatable diet, and increased sedentary lifestyle. Some other identified possible contributions to recent increase of obesity are: (a) insufficient sleep, (b) endocrine disruptors (environmental pollutants that interfere with lipid metabolism), (c) decrease variability of ambient temperature (d) decreased rates of smoking, because smoking suppresses appetite, (e) increased use of medications that can cause weight gain (e.g., atypical antipsychotics), (f) proportional increases in ethnic and age groups that tend to be heavier, (g) pregnancy at a later age (which may cause susceptibility to obesity in children), (h) epigenetic risk factors passed on generationally, (i) natural selection for higher BMI (j) assertive matting lead to increased concentration of obesity risk factor [23, 24]. Ayurveda describes many etiological factors of *Sthaulya roga*, which are related to all aspects at life and affect the body. These factors are classified into:

- *Aharatmaka Nidana* (Dietary)
- *Viharatmaka Nidana* (Regimens)
- *Manas Nidana* (Psychological)

Aharatmaka Nidana

Ati sampurana (Over eating), *Santarpana* (over nourishing), *Guru Aharasevana* (Excessive consumption of Heavy food), *Madhura Aharasevana* (Excessive consumption of sweet food), *Snigdha Aharasevana* (Excessive consumption of unctuous food), *Sleshmala Aharasevana* (Kapha increasing food), *Navannasevana* (Usage of fresh grains), *Nava madya sevana* (Usage of fresh alcoholic preparation), *Gramya Rasasevana* (Usage of domestic animal's meat & soups), *Mamsa sevana* (Excessive use of meat), *Paya Vikar sevana* (Excessive usage of milk and it's preparations), *Dadhi Sevan* (Excessive use of curd), *Sarpi sevana* (Usage of Ghee), *Ikshu Vikara sevana* (Usage of sugarcane's Preparations), *Guda Vikara sevana* (Usage of jaggery's preparations), *Shali sevana* (Excessive use of Rice), *Godhum sevana* (Excessive use of wheat).

Viharatmaka Nidana

Avyayam (Lack of physical exercise), *Avyavaya* (Lack of sexual life), *Divaswap* (Day's sleep), *Asana Sukha* (Luxurious sitting), *Bhojanotar Nidra* (Sleeping soon after meal).

Manasvyaparatmaka Nidana

Harshnityatvat (Uninterupted cheerfulness), *Achintanat* (Lack of anxiety), *Manasonivritti* (Relaxation from tension), *Priyadarshana* (Observations of beloved things).

ASSESSMENT OF OBESITY

- On the basis of BMI Weight in kg/ (Height in meter)^2
  - BMI< 18.5 underweight
  - 18.5-24.9 normal weight
  - 25.0-29.9 overweight
  - 30.0-34.9 class I obesity
  - 35.0–39.9 class II obesity
  - ≥ 40.0 class III obesity

- Waist to Hip ratio

If it is more than 1 in male and 0.85 in females is Obesity.

PATHOGENESIS OF OBESITY [9]

The three main factors involved in the pathogenesis of obesity:

- Excessive lipid deposition
- Diminished lipid mobilization and
- Diminished lipid utilization.

Excessive lipid deposition is due to either increased food intake, hypothalamic lesions, adipose cell hyperplasia or hyperlipogenesis. Increased food intake in form of carbohydrates, proteins, and fats by metabolic process lastly converts in fat and get stored at fat depots.

Diminished lipid mobilization is due to either decrease lypolytic hormones or defective cells or abnormality of autonomous innervations. Thyroxin and adrenaline stimulate mobilization of unsaturated fatty acids from adipose tissue, abnormality of these two causes diminished lipid mobilization and excessive lipid deposition ultimately leads to obesity.

Diminished lipid utilization is due to ageing, defective lipid oxidation, defective theromogenesis or inactivity. It is the main pathology in middle age obesity.

ADVERSE EFFECTS OF OBESITY ON HEALTH

Previously obesity and overweight were considered to be the signs of wealthy and prosperous people. However in present world the proverb "health is wealth" seems to have more significance in day to day life. Weight gain and obesity have become a common problem leading to a number of health hazards. Obesity is a type of disease which invites many major and minor diseases.

Pre-diabetes and Type 2 Diabetes [10]

BMI, abdominal fat distribution, and weight gain are important risk factors for the development of type 2 diabetes. It is estimated that 90% of individuals with type 2 diabetes are obese.

Dyslipidemia [11]

Visceral obesity is associated with elevated triglycerides, low HDL cholesterol, and increased small dense LDL particles.

Coronary Artery Disease (CAD) [12]

Obese persons, particularly those with abdominal fat distribution, are at increased risk for CAD. The American Heart Association added obesity to its list of major risk factors for CAD in 1998.

Sleep apnoea

Obese men and women are also at high risk for sleep apnoea, in which partial or complete upper airway obstruction during sleep leads to episodes of apnoea or hypopnoea. The interruption in night time sleep and repeated episodes of hypoxemia lead to daytime drowsiness, morning headache, systemic hypertension, and may result in pulmonary hypertension and right heart failure.

Cognitive dysfunction

Various studies have shown an association between obesity and cognitive dysfunction, including worse executive function and memory deficits. Although obesity is linked with many diseases that are associated with cognitive dysfunction, some imaging studies have shown lower overall brain volume [13] and grey and white matter in obese versus normal weight individuals without weight-related co-morbidities [14]. Lower brain volumes have also been found in obese individuals with mild cognitive impairment and Alzheimer's disease [15].

One study found that obesity in middle age may be associated with developing dementia later in life, but may be protective in older-aged adults. A systematic review of longitudinal population-based studies concluded that higher BMI is likely a risk factor for developing dementia [16].

Non-alcoholic fatty liver disease

Obesity is associated with a spectrum of liver disease known as non-alcoholic fatty liver disease (NAFLD) or non-alcoholic steatohepatitis (NASH). Manifestations of this disorder include hepatomegaly, abnormal liver function tests, and abnormal liver histology including macro vesicular steatosis, steatohepatitis, fibrosis, and cirrhosis [17].

Cancer

Overweight and obesity are associated with increased risk of endometrial, oesophageal, renal, pancreatic, ovarian, breast, colorectal, thyroid, and gallbladder cancers. They are also associated with leukaemia, multiple myeloma, non-Hodgkin's lymphoma, and malignant melanoma [18].

MANAGEMNET OF OBESITY

Non-pharmacological approach for management of obesity (*sthulya*) involves diet and various *yogic* techniques like *asana*, *pranayama*, and meditation.

Diet [19]

The primary focus of dietary approach in obese is to reduce overall calorie consumption. If calorie consumption is less than the calorie intake in daily routine, then the calories are accumulated in the form of fats. Increase in fat reduces body movements, which again increases the weight. So as to reduce the fat one must control the food habits. Foods with low-energy density include soups, fruits, vegetables, oatmeal, and lean meats. Dry foods and high-fat foods such as pretzels, cheese, egg yolks, potato chips, and red meat have a high-energy density so they should be avoided. Diets containing low-energy dense foods have been shown to control hunger and result in decreased caloric intake and weight loss.

In Ayurveda foremost and very important principle of weight loss is Nidana Parivarjana. It has a great importance in the management and also in the prevention of various diseases. The *Sthaulya* Rogi should avoid the causative factors of obesity, such as lack of exercises, Sleeping in daytime, Kapha Dosha aggravating diet, Excessive intake of foods, which are difficult for digestion, such as consuming sweet, cold and unctuous food contents in excess quantity [20]. Diet is the one of the unique aspects described in details for healing every disease. If a proper diet is followed, there is little need of any kind of medicines, and if not followed, medicines alone can accomplish. Many foods in Ayurveda described for prevention and control of obesity such as heavy and non-unctuous food, Old Rice, oats, barley, green gram, bengal gram, horse gram, red lentil, Sponge gourd , horse radish , brinjal ,cucumber , ginger , radish , carrot , jamun, bilva, Triphala, cardamom, black pepper, long pepper , citrus fruits, honey, buttermilk, lukewarm water, intake of water before meal. Gary D. Foster *et al*. in 2003, in a randomized trial found the direct relation between diet and obesity [21].

Yogic practices and meditation

Yogic practices have an important role to play in the treatment of obesity, and it should be a regular part of a person's lifestyle. Yoga offers men a conscious process to solve the problems of daily life and helps to control oneself more effectively, whether to lose weight or to gain it. *Yoga* leads life to a self disciplined, self regulatory and self conscious approach, helping the individual to control over the improper diet and lifestyle. Various self controlled postures called *Yoga* techniques, which affects body, internal organs, endocrine glands, brain, and mind. *Yoga* positions or postures are especially useful to reduce the fats in various parts, especially forward bending *asanas* i.e. *Mandukasana*, *Paschimottanasana*, backward bending

asanas i.e. *Katichakrasana* and twisting i.e. *Ardhmatsyndrasana, Triyakatrikonasana,* help to reduce the fats near abdomen, hips and other areas. Many yogic practices proved effective in obesity like Joint movements, *Surya namaskar, Pawanamuktasana, Shalbhasana, Bhujangasana, Kapalbhati, Agnisara, Bhastrika* and Meditation. Prayer also plays an important role for the relaxation of mind. Its anxiolytic and stress modifying effect is already search out. Alpha rhythm becomes prominent during prayer and its general causative effect is observed on all over the body. Management of overweight and obesity through specific yogic procedure and observed that yogic procedures significantly decrease weight and BMI of trial group [22].

CONCLUSION

Obesity (*Sthaulya*) is not only confined to developed countries but it is spreading globally. As the obesity exposes human body, it is the risk of various chronic disorders. So it is essential to prevent obesity (*sthulya*) to avoid others terrible disorders like diabetes mellitus, chronic heart disease, dyslipidaemia. Change in dietary pattern plays a significant role in weight loss. *Ayurveda* also give sufficient focus on *sthulya* and serves as a guideline to advise diet to prevent the disease. *Yogic* techniques play an important role in the management of Obesity by affecting body, internal organs, endocrine glands, brain, and mind. Non-pharmacological approach like diet, *asnas, pranayama,* and meditation bring out the most expectant hope for the management of obesity (*sthaulya*).

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