



## Childhood Obesity: An Escalating Epidemic

Deepshikha\*<sup>1</sup>, Rai Amit Kumar<sup>2</sup>

<sup>1</sup>Assistant Professor, Dept. of Kaumarbhritya, Uttarakhand Ayurved University Campus, Gurukul Kangri, Haridwar, Uttarakhand, India.

<sup>2</sup>Medical Officer, Ch. Brahm Prakash Ayurved Charak Sansthan, New Delhi, India.

### Address for correspondence : Dr. Deepshikha

Assistant Professor, Dept. of Kaumarbhritya, Uttarakhand Ayurved University Campus, Gurukul Kangri, Haridwar, Uttarakhand, India.

Email: deepbhu10@gmail.com

### ABSTRACT

Obesity, a nutritional disorder among children and adolescents is reaching alarming proportions in India and world. Obesity impacts the child's immediate health, educational attainment and quality of life. This article reviews the current scenario on the issue, its etiological factors, impact and management. Marketing of unhealthy foods and sugary beverages are major factor in the increase in number of children being overweight and obese. It is noted that it is important to address the problem of overweight and obesity at school level itself because otherwise it can lead to disease burden which will continue into adulthood. It may be linked to rise of adult diseases in youth like hypertension, type 2 diabetes mellitus, heart disease and osteoporosis. Promoting intake of healthy foods, promoting physical activity, preconception and pregnancy care are required to reverse this trend.

**KEYWORDS:** Childhood obesity, Medoroga, Sthaulya, Nutritional disorder

### INTRODUCTION

The word obesity is derived from a latin word "obesus," which means to eat. It is a condition or physical state of the body characterized by over accumulation of fat under the skin and around certain internal organs. Obesity and overweight are primary leading factors to cause diseases like diabetes mellitus, hypertension, coronary artery disease, gall bladder disorders, certain types of cancer and other associated diseases like varicose veins, abdominal hernia, osteoarthritis of knee, hip joints, lumbar spine and reduced pulmonary functions – all resulting in lower life expectancy. World Health Organization has identified obesity as one of the dominant unmet global health issues. India is reporting around 22% prevalence rate over the last five years in children and adolescents. Globally the trend is high among children under five years of age with atleast 41 million found to be obese or overweight in 2014.<sup>[1]</sup> It is rising at fastest pace among all developing countries from 7.5 million in 1990 to 15.5 million in 2014.<sup>[2]</sup> . If current trends continue the number of overweight or obese infants and young children globally will increase to 70 million by 2025.<sup>[3]</sup> All this makes the management of obesity a priority. Ayurvedic classics have dealt this disease under the heading of 'Sthaulya' and included it under 'Astanindita Purusha'.<sup>[4]</sup>

Body mass index is used to determine childhood overweight and obesity. Overweight is defined as a BMI at or above the 85<sup>th</sup> percentile and below the 95<sup>th</sup> percentile for children and teens of the same age and sex.<sup>[5]</sup> Obesity is defined as a BMI at or above the 95<sup>th</sup> percentile for children and teens of the same age and sex.<sup>[6]</sup> Genetics, environment, metabolism, lifestyle, and eating habits, all are believed to play a role in the development of childhood obesity. However, less than 10% may be associated with genetic or hormonal causes whereas more than 90% cases of obesity are idiopathic.

### CAUSATIVE AND CONTRIBUTING FACTORS

The environment in which children are conceived, born and raised can contribute to their risk of becoming overweight or obese. Gestational diabetes may result in increased birth weight during pregnancy and risk of obesity later in life. During childhood, excess fat accumulates when total energy intake exceeds total energy expenditure. Ayurveda has described the etiology of obesity as excessive intake of heavy, sweet, cold and fatty food, along with lack of physical and mental exercise, day sleep as well as genetic susceptibility.<sup>[7]</sup> Heavy food are those having higher calorie content and food in amount larger than required for healthy person. Sweet refers to food items having higher sugar content as well as having higher glycemic index. Fatty food contains oil or ghee or animal fat, thus contributes to weight gain. Sedentary lifestyle associated with excessive television viewing, excessive computer use, and insufficient physical activity is also an important contributing factor towards childhood obesity. However, in absence of above reasons too, a child may become obese due to familial or hereditary factors. Endocrinal disorders like hypothyroidism, cushing's syndrome, PCOD and various genetic disorders along with medications like corticosteroids may also be responsible in causing overweight and obesity.

### CLINICAL FEATURES

According to *Acharya Charak*, obese individuals are deficient in longevity, slow in movement, weak, have increased hunger, thirst and foul smelling sweat.<sup>[8]</sup> In case of an overweight person, other *dhatu*s (tissues) do not grow as much as *meda dhatu* (fat). This affects longevity. The body movement is impaired due to the looseness and heaviness of fat. Weakness prevails as the equilibrium of *dhatu*s is disturbed. Foul odour is caused by the inherent defect and nature of *meda dhatu* and also due to excessive sweating. Excessive *agni* and vitiated *vayu* causes increased thirst and hunger.<sup>[9]</sup> Dyspnoea on exertion is also seen in later stages. Owing to an excessive deposition of fat, the buttock, abdomen and breast become pendulous and his strength is rendered disproportionate to his physical growth.<sup>[10]</sup> Obesity can be diagnosed by parameters like body weight, body mass index (BMI), waist circumference, waist / hip ratio, skin fold thickness etc.

### DIAGNOSTIC EVALUATION

- Blood Sugar (fasting and post-prandial)
- Lipid Profile and Thyroid Profile
- HbA<sub>1c</sub> , Serum Insulin and Cortisol
- Growth hormone, Serum FSH, LH, Prolactin

### OUTCOME OF CHILDHOOD OBESITY

Obese children are more likely to develop a variety of health problems as adults. These include:

- Insulin resistance and Diabetes mellitus
- Dyslipidemia and Fatty liver
- Hypertension and Cardiovascular disease (esp. coronary artery disease)
- Sleep apnea, Disability
- Musculoskeletal disorders (esp. osteoarthritis and gout)
- Malignancy (endometrial, breast and colon cancers)

### PREVENTIVE MEASURES

Childhood obesity, as well as related non-communicable diseases, are largely preventable. Prevention is the most feasible option for curbing the childhood obesity epidemic. The goal in fighting the childhood obesity epidemic is to achieve an energy balance which can be maintained throughout. Exercise in association with dietary restrictions; provide long-term weight control in children and adolescents. The following lifestyle should be adopted:

- Avoid sweets, cold drinks, fried, fatty, spicy, starchy and sugar containing food, banana, mangoes, potato, tea, coffee, cocoa, rice, white flour, refined cereals, non-vegetarian foods.
- Milk products like cheese, butter should also be avoided because these are rich in fat.
- Fibre-rich vegetables and fruits are low calorie foods, so these should be consumed more frequently. Salad should form a major part of meals.
- Lukewarm water should be used for drinking.
- Do not take meals, unless the previously taken food is digested. In between, one can have lots of lukewarm water, thin buttermilk, salads and fruit. One should have an early and light dinner.
- Exercise is an important part of weight reduction plan. Encourage children to participate in physical activity for atleast an hour and to limit time spent watching television and videos and playing computer games. Regular walking for 20-30 minutes per day is the best exercise to begin with and may followed by running, swimming etc. Exercise can facilitate weight control through increase in energy expenditure. Also, it decreases body fat, increases lean body mass and improves psychological well-being.

## MANAGEMENT

Any therapeutic interventions in childhood obesity must achieve control of weight gain and reduction in body mass index safely and effectively and should prevent the long-term complications of obesity in childhood and adulthood. Active participation and support of family members is essential as successful treatment often requires a change in the entire family's approach to eating and physical activity.

In Ayurveda, rational therapeutic approach described to bring about equilibrium of *doshas* and *dhatu*s consists of two major components complementing each other viz. *Samsodhana* (purification) and *Samshamana* (palliation). The patient is subjected to biopurificatory therapy especially lekhana basti and virechana in order to cleanse the channels of the body. External purification therapy is also mentioned in *sthaulya chikitsa* especially *ruksha udavartana* and *sarvanga vasha swedana*. It is followed by palliative treatment with the help of *ausadhi* (drugs), *anna* (dietetics) and *vihara* (exercise and appropriate life style). Administration of *guru* and *apatarpan dravya*<sup>[11]</sup> which possesses additional *vata*, *shleshma* and *medonasaka* properties are considered ideal for *sanshamana* therapy. By virtue of their heaviness such diet would minimize the force of the aggravated digestive power and due to their non-nourishing nature they would help to reduce fat. So drugs having *katu*, *tikta rasa*, *ruksha*, *ushna*, *tikshna*, *khara guna* along with *deepana*, *pachana*, *lekhana*, *chedana* and *meda upashoshan* properties can be used for treatment of overweight and obesity. These medicines improve defective metabolism as seen in obesity.

Drugs like *Guggulu*, *Rasanjana*, *Triphala*, *Trikatu*, *Vacha*, *Vidanga*, *Chitraka*, *Gomutra*, *Madhu* etc. helps to reduce *meda* and remove obstruction from body channels, particularly from *Medovaha srotas* by virtue of its *lekhana*, *chedana* and *srotovishodhana* properties. *Guggulu* is also proven to be having potent hypolipidemic activity. Formulations like *Navaka guggulu*, *Vyoshadi guggulu*, *Triphala guggulu*, *Arogyavardhini vati*, *Trayushanadi lauha*, *Medohara Vidangadi lauha*, *Lauha bhasma*, *Triphala churna*, *Vidangadi churna*, *Vacha churna*, *Lauhasava*, *Takrarista* may be prescribed to overcome the excess weight. Acharya *Vagbhatta* mentioned the *Pragabhakta Kala* i.e. administration of medicine before meal for *Karshana* purpose.<sup>[12]</sup> *Sharangdhara* also advised to take *Lekhana* drugs on empty stomach in early morning.<sup>[13]</sup>

*Yoga & pranayama* also help in maintaining healthy body metabolism. Important *asana* like *Suryanamaskar*, *Trikonasana*, *Halasana*, *Vajrasana*, *Bhujangasana*, *Dhanurasana*, *Chakrasana*, *Ardha-matsyendrasana* along with *Kapalbhati* and *Bhastrika pranayama* may be advised to reduce weight. Regular follow-up is indicated in children with obesity for reinforcement of nutritional goals and exercise objectives, family support and counselling, assessment of growth and pubertal development along with assessment of glucose tolerance and lipid levels. Acute and chronic complications related to childhood obesity may also be identified and managed during regular follow-up.<sup>[14]</sup>

## CONCLUSION

Obesity can severely impact the health of children. Obese children have a high incidence of diabetes mellitus and heart disease. There is a need of spreading awareness about the need for a healthy diet and being more physically active at home and in schools. Schools particularly play a critical role in emphasizing about healthy eating and adequate physical activity. Treatment should be aimed at realistic goals that emphasize gradual reductions in body weight. A low-calorie balanced diet and physical activity are the key to success of management. Childhood obesity which is now an escalating epidemic should be curbed aptly today; else it would lead to a society of obese and unhealthy adults tomorrow.

## REFERENCES

1. Report of the commission on ending childhood obesity. WHO Document Production Services, Geneva, Switzerland, 2016.p.2
2. <http://www.who.int/end-childhood-obesity/news/launch-final-report/en/>
3. <http://www.who.int/end-childhood-obesity/en/>
4. Shastri KN, Chaturvedi GN, editors. Charak Samhita (Vidyotini Hindi Commentary), Reprint edition, Vol.1. Chaukhambha Bharati Academy, Varanasi, 2004. Sutra Sthana, 21/3. p-407
5. [http://www.cdc.gov/healthyweight/assessing/bmi/childrens\\_bmi/about\\_childrens\\_bmi.html](http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html)
6. [http://www.cdc.gov/healthyweight/assessing/bmi/childrens\\_bmi/about\\_childrens\\_bmi.html](http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html)
7. Shastri KN, Chaturvedi GN, editors. Charak Samhita (Vidyotini Hindi Commentary), Reprint edition, Vol.1. Chaukhambha Bharati Academy, Varanasi, 2004. Sutra Sthana, 21/4. p-409
8. Shastri KN, Chaturvedi GN, editors. Charak Samhita (Vidyotini Hindi Commentary), Reprint edition, Vol.1. Chaukhambha Bharati Academy, Varanasi, 2004. Sutra Sthana, 21/4. p-409
9. Shastri KN, Chaturvedi GN, editors. Charak Samhita (Vidyotini Hindi Commentary), Reprint edition, Vol.1. Chaukhambha Bharati Academy, Varanasi, 2004. Sutra Sthana, 21/4. p-409
10. Shastri KN, Chaturvedi GN, editors. Charak Samhita (Vidyotini Hindi Commentary), Reprint edition, Vol.1. Chaukhambha Bharati Academy, Varanasi, 2004. Sutra Sthana, 21/9. p-411
11. Shastri KN, Chaturvedi GN, editors. Charak Samhita (Vidyotini Hindi Commentary), Reprint edition, Vol.1. Chaukhambha Bharati Academy, Varanasi, 2004. Sutra Sthana, 21/20. p-414
12. Tripathi RD, editor. Astanga Samgraha (Saroj Hindi Commentary), Reprint edition. Chaukhambha Sanskrit Pratishthan, Delhi, 2003. Sutra Sthana, 23/14. p-429
13. Srivastava Shailaja, editor. Sharngadar Samhita (Jiwanprada Hindi Commentary), Reprint edition, Chaukhamba Orientalia, Varanasi, 2009. Madhyama Khand, Chapter-2/4. p-15.
14. <http://emedicine.medscape.com/article/985333-treatment#d14>