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## Obesity and Associated Health Risks

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### Review Article

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#### ABSTRACT

Obesity is the condition in which excess fat is accumulated in the body reflecting the health in various diseases such as type 2 diabetes, heart diseases, various types of cancer etc. Obesity is due to lack of physical activity, excess intake of food and hereditary in few cases. Obesity associates with various health risks such as coronary heart disease, high blood pressure, abnormal blood fats, gastrointestinal disorders, metabolic syndrome, osteoarthritis, cancer, sleep disorders, obesity hypoventilation syndrome, gallstones, stroke, type 2 diabetes, reproductive problems and health problems in children and teens.

#### INTRODUCTION

Obesity is a body disease occurring in people of all ages in both developed and developing countries [1]. Obesity is the serious public health concern globally, In 2011-2012, over two-thirds of adults in the United States were obese or overweight. Recent studies revealed that direct medical costs are high for obesity, cardiovascular disease and type 2 diabetes and comorbidities [2]. The frequency of overweight and obesity and the associated factors with the health risks [3]. Poor sleep and working for long hours elevates the risk of obesity [4]. The prevalence of obesity is increasing year by year globally [5]. The health risks associated are:

#### *Gastrointestinal disorders*

Recent studies revealed that the prevalence of obesity in patients with GI symptoms was found to be high. Among patients with upper GIT disorders such as Heart burn, dyspepsia, upper abdominal pain/discomfort and GERD obesity impacts the gastro intestinal life quality [6]. BMI of the patients is directly proportionate with the GI symptoms.

#### *Cardiovascular factors*

Overweight and obesity are associated with risk of developing diabetes mellitus and cardiovascular diseases [7]. Obesity is predisposing to coronary artery disease (CAD) and adverse cardiovascular event<sup>s</sup>. The traditional factors like, metabolic syndrome, hyperlipidemia, hypertension, diabetes, diabetes mellitus, dyslipidemia, arrhythmias [8], Venous Thromboembolism [9,10] and various other cardiovascular risk factors are associated with obesity [11,12].

#### *Menopausal women*

Postmenopausal women are frequently troubled by increasing weight and increase in the circumference of caused due to obesity and fat redistribution [13]. The mass of fat tissue is associated with age. Many other factors such as aging, genetic factors, ethnicity, dietary practices, resting metabolic rate, reduced lean mass and various

drug treatments impacts the obesity in the menopause. Increased body fat in women after menopause is due to the physical inactivity and aging affect adipose tissue in storage and oxidation of fatty acid <sup>[13]</sup>. Obesity is associated with polycystic ovarian syndrome, endometrial neoplasia, menstrual disturbances and subfertility etc <sup>[14]</sup>.

### ***Childhood obesity***

Childhood obesity is a significant challenge of public health. Many studies have been conducted in the rising trends among young children internationally in both developing and developed countries. The imbalance between intake and expenditure of energy factors contribute to the development <sup>[15]</sup>. Lack of physical activity, unhealthy eating habits leads to childhood obesity in general <sup>[16]</sup>. The cognitive function of school children is associated with dietary intake. The family income and obesity in children are interconnected. Over weight gain early in childhood leads to adult morbidity and mortality related to obesity <sup>[17]</sup>.

### ***Vitamin D deficiency***

Regardless sex and race, many studies prove that vitamin D deficiency is associated with obesity. After various types of fragility fractures, Obesity increases the risk of complications in population <sup>[18]</sup> and in post-menopausal women <sup>[19]</sup>.

### ***Cancer***

Obesity is also a risk factor for varieties types of cancer [20] associating pancreatic, colorectal, endometrial, hepatocellular, Non-Hodgkin's Lymphoma, cervical, esophagus, thyroid, malignant melanoma, post-menopausal breast cancer <sup>[21,22]</sup>, kidney cancer and gallbladder cancer <sup>[23]</sup>. Obesity is the independent risk factor for diabetes and cancer.

### ***Oxidative stress***

Several studies reported that obesity is one of the reasons for systemic oxidative stress which results in an irregular production of adipokines, contributing to the development of the metabolic syndrome <sup>[24]</sup>.

### ***Fertility and pregnancy***

Obesity causes increase in the production of insulin and resistance to insulin, which may leads to erratic ovulation in women causing infertility (polycystic ovarian syndrome) <sup>[25]</sup>. The prevalence of obesity in women in child bearing age is increasing globally <sup>[26]</sup>.

### ***Thyroid dysfunction***

Some data show that association of obesity and hypothyroidism is one of the important risk factors for atherosclerotic cardiovascular disease accelerated by the effects of thyroid hormones on lipid metabolism and blood pressure <sup>[27]</sup>.

### ***Circadian clock***

The circadian clock system in humans drives many physiological processes like hormonal secretion, daily rhythms of sleep-wake behavior and metabolism. Obesity has significant impact on the circadian alignment <sup>[28]</sup>.

### **Renal toxicity**

Obese patients are more prone to renal toxicity associated with chronic renal disease for which obesity is the independent risk factor. Pharmacokinetics of drugs plays a role in obese patients. Obesity has significant impact on renal dysfunction [29].

### **Depression**

Studies show that, depression and obesity has significant relation in children and in adolescents. The relation is sequelae, instead of a symptom and obesity and depression are reciprocal to each other [30,31].

### **Atherosclerosis**

Obesity is one of the major factors for the development of atherosclerosis along with insulin resistance and hypertension due to repetitive metabolic stimuli striking the vessel wall [32]. Obesity is risk factor for the development of intima-media thickness of carotid artery.

### **Hypothalamic alterations**

Body energy imbalance caused by obesity and associated body fat accumulation causes alterations in hypothalamus as body energy balance is controlled by specific neurons in hypothalamus. The hypothalamic alterations are reported by several cases [33].

### **Testosterone levels**

Testosterone levels reduce into the hypogonadal range in male obesity. hypogonadotropic hypogonadism, is observed in obese men in large percentage [34].

### **Respiratory diseases**

Obesity is associated with wide range of health diseases such as asthma; chronic obstructive pulmonary disease etc. obesity may affect the diaphragm, the thorax and the abdominal muscles also sometimes [35].

### **Neurological disorders**

Neurological disorders such as stroke, Alzheimer's disease, cognition, and depression are associated with the obesity directly or indirectly. The type of diet impacts the structure and functioning of brain.

### **Severity of fibromyalgia**

The symptoms of Fibromyalgia such as pain, fatigue, stiffness, tenderness, unrefreshing sleep, psychological and physical impairment increases with obesity in population [36,37].

### **Pancreatic disorders**

The pancreatic disorders are associated with obesity due to the accumulation of ectopic lipid in pancreas disrupting  $\beta$  cell functioning along with chronic inflammation of obesity-induced low-grade [38].

### **HIV**

Excess weight and adverse medical consequences impacts the HIV-infected patients due to metabolic imbalances [39,40].

### **Others**

Physical Activity and Sedentary behaviour, excessive eating, overweight [41] etc are the risk factors of obesity in rural adolescents in rural communities [42].

## CONCLUSION

A global rise of obesity is the major public health problem globally. All these risks not only attribute to the high morbidity and mortality rates among people, but also threatens the survival of healthy families within the community. Changes in lifestyles are necessary in order to reduce the obesity-related complications. The design of treatment and management approach should reduce all risk factors.

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