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COMORBID CONDITIONS IN CHILDREN WITH EXCESS BODY WEIGHT

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Abstract

Childhood overweight and obesity have become major public health challenges worldwide. According to the World Health Organization, the prevalence of excess body weight among children and adolescents has increased dramatically over the past decades, affecting both developed and developing countries. Excess body weight in childhood is not merely a cosmetic issue but a serious medical condition associated with a wide range of comorbidities that can affect almost every organ system. These comorbid conditions may begin in childhood and persist into adulthood, significantly increasing morbidity, mortality, and healthcare costs.

Comorbidity refers to the presence of one or more additional diseases or disorders co-occurring with a primary disease. In children with excess body weight, comorbid conditions can be metabolic, cardiovascular, respiratory, gastrointestinal, musculoskeletal, endocrine, and psychological in nature. Early identification and management of these conditions are essential to prevent long-term complications and improve quality of life. This article reviews the most common comorbid conditions associated with excess body weight in children and discusses their clinical significance.

Keywords: Childhood obesity, overweight children, comorbid conditions, metabolic disorders, insulin resistance, type 2 diabetes mellitus, cardiovascular risk, hypertension, non-alcoholic fatty liver disease, obstructive sleep apnea, psychological comorbidities.

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Metabolic Comorbidities

Insulin Resistance and Type 2 Diabetes Mellitus

One of the most significant metabolic consequences of excess body weight in children is insulin resistance. Increased adipose tissue, particularly visceral fat, leads to impaired insulin sensitivity due to chronic low-grade inflammation and altered secretion of adipokines. As a result, the pancreas compensates by producing more insulin, which may eventually lead to beta-cell dysfunction.

In recent years, type 2 diabetes mellitus (T2DM), once considered a disease of adults, has become increasingly prevalent among children and adolescents with obesity. Children with T2DM are at high risk of developing early microvascular and macrovascular complications, including nephropathy, retinopathy, and cardiovascular disease. Early onset of diabetes significantly shortens life expectancy and increases the burden of chronic disease.

Dyslipidemia

Dyslipidemia is another common metabolic comorbidity in children with excess body weight. It is characterized by elevated levels of triglycerides, low-density lipoprotein cholesterol (LDL-C), and reduced levels of high-density lipoprotein cholesterol (HDL-C). These lipid abnormalities contribute to the early development of atherosclerosis, which may begin in childhood and progress silently over decades.

Cardiovascular Comorbidities

Hypertension

Elevated blood pressure is frequently observed in overweight and obese children. Excess adipose tissue increases blood volume and cardiac output and activates the renin–angiotensin–aldosterone system, leading to hypertension. Pediatric hypertension is often asymptomatic, making routine screening essential.

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If left untreated, hypertension in childhood may persist into adulthood and significantly increase the risk of coronary artery disease, stroke, and heart failure. Early lifestyle interventions have been shown to effectively reduce blood pressure in this population.

Early Atherosclerosis

Evidence suggests that children with excess body weight may develop early signs of atherosclerosis, such as increased carotid intima-media thickness and endothelial dysfunction. These changes indicate that cardiovascular disease may originate in childhood, emphasizing the importance of early prevention strategies.

Respiratory Comorbidities

Obstructive Sleep Apnea

Obstructive sleep apnea (OSA) is a common respiratory comorbidity in children with excess body weight. It is caused by upper airway obstruction during sleep due to fat deposition in the neck and pharyngeal structures. Symptoms include loud snoring, daytime sleepiness, poor concentration, and behavioral problems.

Untreated OSA can lead to neurocognitive impairment, poor academic performance, and increased cardiovascular risk. Weight reduction is a key component of management and often leads to significant improvement in symptoms.

Asthma

Several studies have demonstrated a strong association between obesity and asthma in children. Excess body weight may worsen asthma symptoms through mechanical factors, systemic inflammation, and altered immune responses. Obese children with asthma often have poorer disease control and reduced response to standard therapies.

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Gastrointestinal and Hepatic Comorbidities

Non-Alcoholic Fatty Liver Disease

Non-alcoholic fatty liver disease (NAFLD) is one of the most common liver disorders in children with excess body weight. It ranges from simple steatosis to non-alcoholic steatohepatitis, fibrosis, and cirrhosis. NAFLD is often asymptomatic and may be detected incidentally through elevated liver enzymes or imaging studies.

If untreated, NAFLD can progress to end-stage liver disease in adulthood. Lifestyle modification remains the cornerstone of treatment, with weight loss shown to improve liver histology.

Gastroesophageal Reflux Disease

Children with excess body weight are at increased risk of gastroesophageal reflux disease (GERD). Increased intra-abdominal pressure and delayed gastric emptying contribute to reflux symptoms such as heartburn, regurgitation, and chest discomfort.

Musculoskeletal Comorbidities

Excess body weight places additional stress on the developing musculoskeletal system. Common problems include flat feet, joint pain, and altered gait patterns. Obese children are also at increased risk of orthopedic conditions such as slipped capital femoral epiphysis and Blount disease.

These conditions may limit physical activity, creating a vicious cycle that further promotes weight gain and physical inactivity.

Endocrine and Reproductive Comorbidities

Early Puberty and Hormonal Imbalances

Excess body weight can affect hormonal regulation and pubertal development. Obese girls are more likely to experience early onset of puberty and menarche,

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while obese boys may experience delayed puberty. Adipose tissue influences estrogen production, leading to hormonal imbalances.

Polycystic Ovary Syndrome

Adolescent girls with obesity are at increased risk of developing polycystic ovary syndrome (PCOS), a condition characterized by menstrual irregularities, hyperandrogenism, and insulin resistance. PCOS is associated with infertility, metabolic syndrome, and psychological distress.

Psychological and Social Comorbidities

Psychological comorbidities are among the most underestimated consequences of excess body weight in children. Obese children often experience low self-esteem, body image dissatisfaction, anxiety, and depression. They may also be victims of bullying, stigma, and social isolation.

These psychosocial factors can negatively affect academic performance and emotional well-being and may contribute to disordered eating behaviors. Addressing mental health is a crucial component of comprehensive obesity management.

Conclusion

Excess body weight in children is associated with a wide range of comorbid conditions affecting multiple organ systems. These comorbidities can develop early in life and track into adulthood, leading to significant long-term health consequences. Early identification, prevention, and management of excess body weight and its associated conditions are essential to reduce the burden of chronic disease.

A multidisciplinary approach involving healthcare providers, families, schools, and communities is necessary to address this complex issue. Promoting healthy eating habits, regular physical activity, and psychological support can

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significantly improve outcomes for children with excess body weight and reduce the risk of comorbid conditions.

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