Addressing the Persistent Increase and Inequities in Metabolically Unhealthy Obesity

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Abstract

Metabolically unhealthy obesity (MUO) represents a phenotype characterized by excess adiposity accompanied by metabolic dysfunctions, including insulin resistance, dyslipidemia, hypertension, and inflammation. Despite growing awareness, the global prevalence of MUO is increasing, often disproportionately affecting socioeconomically disadvantaged populations. This article explores the complex pathophysiology of MUO, its epidemiological trends, and the deep-rooted social and economic inequities influencing its distribution. It also reviews emerging strategies for early identification, prevention, and targeted intervention. Addressing MUO requires an interdisciplinary approach that incorporates clinical, societal, and policy-based measures to reduce disparities and promote metabolic health across all populations.

Keywords: Metabolically unhealthy obesity; Insulin resistance; Health disparities; Socioeconomic factors; Chronic disease; Public health; Adiposity; Metabolic syndrome; Obesity epidemic; Healthcare equity

INTRODUCTION

The global obesity epidemic has shifted significantly in recent decades. While much attention has been paid to general obesity, an important subset—metabolically unhealthy obesity (MUO)—demands particular focus due to its association with a higher risk of cardiovascular disease, type 2 diabetes, and mortality [1]. Unlike metabolically healthy obesity (MHO), individuals with MUO exhibit metabolic impairments such as elevated triglycerides, low HDL cholesterol, increased blood pressure, and impaired glucose tolerance [2].

Disturbingly, MUO has become increasingly prevalent even among younger individuals and certain ethnic minorities [3]. This phenotype is deeply intertwined with social determinants of health, including poverty, education level, race, and urbanization, thereby making it not only a clinical but also a societal and ethical challenge.

This article aims to dissect the underlying causes of the rise in MUO, examine its unequal distribution across populations, and propose multi-faceted strategies to address this pressing health issue.

DESCRIPTION

Understanding metabolically unhealthy obesity

MUO differs from other obesity phenotypes by its association with visceral fat accumulation, systemic inflammation, and metabolic dysfunction. These individuals may present with normal BMI but elevated waist circumference or have obesity with insulin resistance and altered lipid profiles [4]. This condition can often transition from or to metabolically healthy obesity, emphasizing its dynamic nature [5].

The major pathophysiological drivers of MUO include:

- Visceral adiposity and ectopic fat deposition (e.g., liver, muscle)
- Chronic low-grade inflammation
- Dysregulated adipokine production
- Mitochondrial dysfunction and oxidative stress [6]

Socioeconomic and demographic factors

Studies show that MUO disproportionately affects individuals in lower socioeconomic groups, minority ethnicities, and those with limited access to healthcare [7]. Urban poor populations face greater exposure to obesogenic environments, including limited access to nutritious foods and safe spaces for physical activity. Women, particularly in low-income countries, are more likely to be metabolically unhealthy due to socio-cultural and biological factors [8].

RESULTS

Recent epidemiological data underscore the alarming rise in MUO:

- Global estimates suggest that up to 60–70% of individuals with obesity are metabolically unhealthy [9].
- The prevalence of MUO in the United States rose by 14% over the last decade, especially among African American and Hispanic populations [10].
- A longitudinal study in Europe found that nearly 50% of MHO individuals transition to MUO within 10 years without lifestyle intervention [5].

Several intervention studies reveal promising yet inequitable outcomes:

- Lifestyle interventions including dietary changes, physical activity, and behavioral counseling can significantly improve metabolic health, but their accessibility is limited in low-resource settings [11].
- Pharmacotherapy and bariatric surgery show efficacy in MUO patients, but uptake is skewed toward higher-income and urban populations [12].

DISCUSSION

The persistent increase in MUO stems from both biological and societal roots. Biological predisposition, poor dietary quality, sedentary behaviour, and chronic stress contribute to MUO development. However, these risk factors are amplified by systemic inequities in income, education, food systems, and healthcare access.

Key challenges in addressing MUO include:

1. **Lack of early screening**: Many individuals are unaware of their metabolic status until complications arise.
2. **Healthcare disparities**: Marginalized groups often lack access to quality care, making early intervention difficult.
3. **Environmental barriers**: Urban design, food deserts, and marketing of unhealthy foods disproportionately affect the disadvantaged.
4. **Policy inertia**: Many national obesity strategies fail to adequately

address the metabolic component or structural determinants.

Strategies to combat MUO should include:

- Community-based screening programs in high-risk populations.
- Policies promoting nutritional equity, including subsidies for whole foods and taxes on sugary products.
- Culturally adapted interventions that address specific needs of minority and underserved populations.
- Expanding access to preventive care and metabolic clinics in rural and low-income urban areas.

CONCLUSION

Metabolically unhealthy obesity is a growing global concern with serious clinical and public health implications. The disproportionate burden it places on marginalized communities highlights the urgent need to integrate metabolic health into broader efforts to reduce health inequities. Combating MUO requires a combination of clinical strategies and bold, equity-focused public health policies that go beyond individual behaviour to address systemic drivers of obesity and metabolic dysfunction.

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