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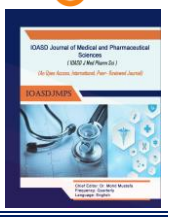

# Hypertension, Diabetes and Obesity—A Deadly Combination

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## ABSTRACT

The prevalence of hypertension and obesity is notably elevated among individuals in India diagnosed with type 2 diabetes. Given that hypertension and diabetes are established risk factors for major morbidity and mortality in the country, it is imperative to incorporate early screening, as well as efficacious prevention and management strategies for hypertension, diabetes, and obesity into the comprehensive care framework for individuals with type 2 diabetes and concomitant hypertension. Heightened awareness pertaining to the contributory role of diabetes, hypertension, and obesity in augmenting morbidity and mortality underscores the critical importance of preventive measures. Proactive screening initiatives for hypertension, diabetes, and obesity within wellness centers should be actively endorsed to facilitate early identification and intervention, thereby mitigating the impact of this pathological triad.

**Keywords:** Hypertension, Diabetes and Obesity.

**Letter to the Editor**

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## RESPECTED SIR,

I would like to bring to your attention the significant health challenges posed by diabetes, a chronic and enduring non-communicable disease that affects the body's ability to convert food into energy. Notably, hypertension is prevalent among patients with type two diabetes Mellitus. India faces alarming rates of diabetes, hypertension, and obesity on a global scale. The emergence of "diabesity," the combination of diabetes and obesity, is becoming a pandemic worldwide. The escalating global epidemic of non-communicable diseases (NCDs) underscores the importance of addressing cardiovascular diseases, with hypertension and obesity being significant risk factors in India. NCDs contribute to 62% of all deaths in India, and 48% of national mortality occurs prematurely, highlighting the pressing public health issue posed by hypertension and diabetes.

Individually, both hypertension and diabesity are associated with an elevated risk of cardiovascular disease, which further intensifies when these conditions coexist. The simultaneous presence of hypertension, diabetes, and obesity substantially contributes to the development and progression of both micro and macro vascular complications, ultimately leading to cardiovascular disease. Hypertension plays a pivotal role in the morbidity and mortality of diabetic patients, significantly elevating the direct and indirect costs associated with diabetes. Data from the Framingham Heart study indicates that the coexistence of hypertension and diabetes increases the rates of mortality and cardiovascular events compared to normotensive diabetic patients.

Moreover, both diabetes and hypertension significantly contribute to the development of dementia and Alzheimer's disease. India, with the highest rates of diabetes and hypertension globally, necessitates a comprehensive understanding of the local prevalence of hypertension in diabetes for informed strategic management. The ongoing obesity epidemic poses a substantial public health impact worldwide, with a threefold increase since 1975. Globally, 39% of adults aged 18 and above are overweight, and 13% are obese, as reported by the World Health Organization in 2016. In India, the prevalence of obesity in adults surpasses 40% in women and 22.3% in men, according to the Indian Council of Medical Research-India Diabetes (ICMR-INDIAB) study.

Obesity is recognized as a chronic, relapsing, multifactorial, neuro-behavioral disease, serving as a major risk factor for NCDs such as type 2 diabetes, hypertension, stroke, heart diseases, osteoarthritis, obstructive sleep apnea, and certain cancers. Traditional interventions for weight loss involve calorie restriction, but alternative dietary approaches such as low-carbohydrate diets, ketogenic diets, meal replacement therapy, and intermittent fasting are gaining popularity. Current guidelines recommend continuous energy restriction, lifestyle modifications, and behavior changes for obesity management, yielding modest weight loss.

As of 2023-24, India is undergoing transformations across all sectors, including healthcare. Non-communicable diseases have surpassed communicable diseases as the major contributors to mortality and morbidity in the Indian population. Ischemic heart disease remains the leading cause among NCDs, with major risk factors being diabetes Mellitus, hypertension, and lipid disorders. Despite medical advancements, the prevalence, incidence, complications, and mortality associated with these diseases continue to rise due to lifestyle changes.

Understanding the prevalence and interplay of diabetes, hypertension, and obesity is crucial for tailored approaches to disease management and prevention. Regional variations in disease patterns necessitate nuanced strategies. A study by Raghuram et al., titled "The deadly duo of hypertension and diabesity in India," provides valuable insights through a new epidemiological perspective.

Four primary reasons for developing hypertension in type two diabetes (NIDDM) are insulin resistance, diabetic nephropathy, volume expansion, and macro and micro vessel changes. Leptin, advanced glycation end products, and down-regulation of peroxisome proliferators active receptors and insulin growth factor receptors also contribute to the complex relationship between hypertension and diabetes. Insulin resistance acts as a common soil for both conditions, with the order of onset varying among individuals. Recognizing insulin resistance as a prediabetic and prehypertensive state is crucial. Simple surrogate indicators, such as mid-segment obesity and a triglycerides/high-density lipoprotein ratio of >3.5, can aid in identifying insulin resistance.

Hypertension prevalence is 1.5 to 3 times higher in diabetes Mellitus patients compared to the general population. Simultaneously, hypertensive patients have a 2.5 times higher risk of developing diabetes within five years than normotensive individuals. Non-dipping and nocturnal hypertension in a diabetic may serve as early predictors of diabetic nephropathy. Ambulatory blood pressure monitoring can identify patients at risk of cardiovascular and kidney diseases in diabetes, supporting therapeutic interventions with angiotensin-converting enzyme inhibitors or angiotensin II receptor blockers. The coexistence of hypertension and diabetes increases cardiovascular disease mortality fourfold.

Diabetes is often accompanied by hypertension, hypothyroidism, dyslipidemia, and urticaria, underscoring the need for comprehensive investigations and treatment plans. Preventive measures should be implemented to avoid the development of hypertension in diabetes and vice versa. Emphasizing early screening for hypertension, diabetes, and obesity in wellness centers is crucial.

In the transformative landscape of 2023-24, with NCDs taking precedence, it is imperative to gather epidemiological information about diabetes, prediabetes, and individuals at high risk of developing diabetes in relation to high normal blood pressure, known hypertension, and newly detected hypertension across India. The study by Raghuram et al. holds significance in providing insights into this area, aiding in the protection, prevention, and prediction of individuals from the detrimental trio of diabetes, hypertension, and obesity.

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