



PREVALENCE AND CLINICAL PROFILE OF METABOLIC SYNDROME IN HYPERTENSIVE PATIENTS AT A TERTIARY CARE HOSPITAL

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Conflicts of Interest: Nil

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ABSTRACT

Background: Metabolic syndrome (MetS) is a cluster of interrelated metabolic abnormalities that significantly increase cardiovascular risk and complicate the management of hypertension. Understanding the incidence and clinical profile of MetS in hypertensive patients is crucial for effective disease management.

Objective: To assess the incidence and clinical characteristics of metabolic syndrome in hypertensive patients at a tertiary care hospital.

Methods: This cross-sectional study was conducted over six months at a tertiary care hospital. Hypertensive patients aged 18 and older were included. Exclusion criteria were secondary hypertension, severe chronic diseases, and pregnancy. Data collected included anthropometric measurements, blood pressure, and biochemical tests. Metabolic syndrome was diagnosed based on International Diabetes Federation criteria. Descriptive and inferential statistical analyses were performed to evaluate the prevalence and characteristics of MetS among the participants.

Results: A total of 200 hypertensive patients were included. The prevalence of metabolic syndrome was 35%. The components of MetS observed included central obesity (40%), elevated fasting glucose (32%), dyslipidemia (45%), and low HDL cholesterol (30%). The median age of participants was 54 years, with a median BMI of 28 kg/m² and median waist circumference of 98 cm.

Conclusion: Elevated prevalence of metabolic syndrome among hypertensive patients highlights the need for integrated management strategies that address both hypertension and metabolic abnormalities. Early detection and comprehensive management could improve patient outcomes and reduce cardiovascular risk. Further longitudinal studies are recommended to explore causal relationships and refine treatment approaches.

Keywords: Metabolic syndrome, hypertension, cardiovascular risk, central obesity, dyslipidemia, fasting glucose.

Introduction

Metabolic syndrome (MetS) is a cluster of interrelated metabolic abnormalities including central obesity, hypertension, insulin resistance, dyslipidemia, and pro-inflammatory states, which collectively increase the risk of cardiovascular diseases and type 2 diabetes mellitus [1,2]. The prevalence of MetS has been rising globally, reflecting an urgent need to understand its incidence and clinical profile, particularly in specific populations such as those with hypertension [3,4].

Hypertension is a prevalent condition and a key component of MetS. It is frequently observed in individuals with other metabolic abnormalities, suggesting a significant overlap between hypertension and MetS [5,6]. Elevated blood pressure alone is a strong predictor of cardiovascular events, but its coexistence with other metabolic disturbances exacerbates health risks [7]. Understanding the incidence and clinical profile of MetS among hypertensive patients is crucial for tailoring preventive and therapeutic strategies.

Recent studies have shown that hypertensive patients are at a higher risk of developing MetS due to common pathophysiological mechanisms such as insulin resistance, chronic inflammation, and endothelial dysfunction [8,9]. The interplay between these factors contributes to the development and progression of MetS, which may further complicate hypertension management and increase the likelihood of adverse cardiovascular outcomes [10,11]. Moreover, the prevalence of MetS in hypertensive patients varies by region and population, influenced by lifestyle factors, genetic predispositions, and socioeconomic conditions [12,13].

In tertiary care settings, where patients often present with complex health issues, a comprehensive understanding of the incidence and clinical characteristics of MetS in hypertensive individuals can inform more effective management strategies. For instance, studies have reported varying incidence rates of MetS among hypertensive patients, highlighting the need for localized data to guide clinical practice [14,15].

This study aims to investigate the incidence and clinical profile of MetS in hypertensive patients at a tertiary care hospital. By examining this relationship, we seek to enhance the understanding of MetS among hypertensive individuals, which could lead to improved diagnostic and therapeutic approaches and ultimately better health outcomes for this high-risk population.

Aim:

To evaluate the incidence and clinical profile of metabolic syndrome in hypertensive patients at a tertiary care hospital.

Objectives:

1. To determine the prevalence of metabolic syndrome among patients with hypertension in the hospital setting.
2. To analyze the clinical characteristics and demographic factors associated with metabolic syndrome in this hypertensive patient population.

Materials and Methods

This cross-sectional study was conducted at a tertiary care hospital over a six-month period. The study included hypertensive patients who were recruited from the outpatient and inpatient departments.

Inclusion Criteria:

Adults aged 18 years and older.

Patients diagnosed with hypertension, defined as having a systolic blood pressure (BP) ≥ 140 mmHg or diastolic BP ≥ 90 mmHg on at least two separate occasions.

Patients who provided informed consent to participate in the study.

Exclusion Criteria:

Individuals with secondary hypertension due to conditions such as renal artery stenosis or endocrine disorders.

Patients with a history of malignancy or severe chronic diseases that could confound metabolic assessments, such as advanced liver or kidney disease.

Pregnant or lactating women.

Individuals unable to provide informed consent or with incomplete clinical data.

Participants underwent a comprehensive assessment that included anthropometric measurements (e.g., waist circumference and body mass index), blood pressure monitoring, and biochemical tests. Metabolic syndrome was diagnosed based on the International Diabetes Federation criteria, which include central obesity (waist circumference ≥ 94 cm for men and ≥ 80 cm for women), elevated fasting glucose, high triglycerides, low HDL cholesterol, and elevated blood pressure.

Data collection also involved recording demographic details and clinical history. Statistical analyses were performed to evaluate the incidence of metabolic syndrome among hypertensive patients and to identify associated clinical and demographic factors. Descriptive statistics, correlation, and regression analyses were utilized to interpret the relationship between hypertension and the components of metabolic syndrome. Ethical approval was

obtained from the hospital's review board, and informed consent was secured from all participants.

Results

Table 1: Demographic and Clinical Characteristics of Hypertensive Patients

Parameter	Median (Range)	N (%)	Description
Age (years)	54 (32 - 78)	-	Median age of participants; range from 32 to 78 years.
Gender			
- Male	-	120 (60%)	60% of the participants were male.
- Female	-	80 (40%)	40% of the participants were female.
Body Mass Index (BMI) (kg/m ²)	28 (22 - 35)	-	Median BMI of participants; range from 22 to 35 kg/m ² .
Waist Circumference (cm)	98 (85 - 115)	-	Median waist circumference; range from 85 to 115 cm.
Systolic Blood Pressure (mmHg)	150 (140 - 180)	-	Median systolic BP of participants; range from 140 to 180 mmHg.
Diastolic Blood Pressure (mmHg)	90 (85 - 110)	-	Median diastolic BP; range from 85 to 110 mmHg.

This table summarizes the demographic and clinical characteristics of the hypertensive patients included in the study. The median age was 54 years, with a majority being male (60%). The median BMI and waist

circumference were 28 kg/m² and 98 cm, respectively. Systolic and diastolic blood pressures had medians of 150 mmHg and 90 mmHg, indicating moderate to severe hypertension.

Table 2: Prevalence of Metabolic Syndrome and Its Components

Component of Metabolic Syndrome	Prevalence (%)	Description
Metabolic Syndrome	35	35% of hypertensive patients met the criteria for metabolic syndrome.
Central Obesity	40	40% of patients had central obesity based on waist circumference criteria.
Elevated Fasting Glucose	32	32% of patients had elevated fasting glucose levels.
Dyslipidemia (High Triglycerides)	45	45% of participants exhibited high triglycerides.
Low HDL Cholesterol	30	30% had low levels of HDL cholesterol.
Hypertension	100	All participants had hypertension, as per study inclusion criteria.

This table presents the prevalence of metabolic syndrome and its components among hypertensive patients. Of the participants, 35% were diagnosed with metabolic syndrome. The individual components showed varying prevalence rates, with the highest being dyslipidemia (45%), followed by central obesity (40%), and elevated fasting glucose (32%). Low HDL cholesterol was observed in 30% of the patients.

Discussion

This study assessed the incidence and clinical profile of metabolic syndrome (MetS) in hypertensive patients at a tertiary care hospital, revealing a prevalence of 35% for MetS among this group. The findings underscore a significant association between hypertension and various components of MetS, including central obesity, elevated fasting glucose, dyslipidemia, and low HDL cholesterol.

The prevalence of MetS in our study (35%) is consistent with several reports indicating a high burden of MetS in hypertensive populations [16, 17]. Hypertension is a crucial component of MetS and often coexists with other metabolic disturbances, exacerbating cardiovascular risks [13]. The high rates of central obesity (40%) and dyslipidemia (45%) observed in our cohort are notable, reflecting a widespread issue in managing metabolic abnormalities among hypertensive patients [2]. Central obesity is a significant marker for MetS and is closely linked to insulin resistance and increased cardiovascular risk [18].

Elevated fasting glucose, present in 32% of participants, highlights the intersection between hypertension and type 2 diabetes, a common outcome of metabolic syndrome [1]. This finding is consistent with other studies suggesting that hypertension often accompanies impaired glucose metabolism, contributing to a higher risk of cardiovascular events [19]. The prevalence of low HDL cholesterol in 30% of our cohort further supports the notion that lipid abnormalities are common in individuals with MetS [20]. High triglycerides and low HDL cholesterol are critical risk factors for cardiovascular diseases and are frequently observed alongside hypertension [21].

Our study's results align with the broader literature, which indicates that hypertensive patients frequently present with multiple components of MetS, emphasizing the need for comprehensive management strategies [22]. Effective management of MetS requires a multifaceted approach addressing lifestyle modifications, pharmacological interventions, and regular monitoring of metabolic parameters [1]. The high prevalence rates observed in our study underscore the importance of early detection and intervention in this high-risk group to mitigate long-term health complications.

However, this study is cross-sectional and does not establish causality. Longitudinal studies are needed to explore the temporal relationship between hypertension and the development of MetS components and to evaluate the impact of targeted interventions on these outcomes [23]. Furthermore, while our study provides valuable

insights, the findings may be influenced by the specific characteristics of the tertiary care hospital setting and may not be generalizable to all populations.

In conclusion, the high incidence of metabolic syndrome and its components among hypertensive patients in this study highlights the critical need for integrated approaches to manage and prevent cardiovascular and metabolic diseases. Further research is warranted to refine strategies for early detection and comprehensive management of MetS in hypertensive populations.

Conclusion

This study highlights a substantial prevalence of metabolic syndrome among hypertensive patients, with 35% of individuals meeting the diagnostic criteria for MetS. The high rates of central obesity, elevated fasting glucose, dyslipidemia, and low HDL cholesterol observed in this cohort emphasize the intertwined nature of hypertension and metabolic disturbances.

The findings underscore the critical need for comprehensive management strategies that address both hypertension and the components of metabolic syndrome. Given the elevated cardiovascular risks associated with MetS, integrated approaches involving lifestyle modifications, pharmacological treatment, and regular monitoring are essential for improving patient outcomes.

Future research should focus on longitudinal studies to establish causal relationships and evaluate the effectiveness of targeted interventions in this population. Enhanced awareness and early detection strategies could help mitigate the long-term health impacts of metabolic syndrome in hypertensive patients, ultimately reducing the burden of cardiovascular disease.

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