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Original Research Article

A Comparative Study on Orthostatic Hypotension in Hypertensive and Non-Hypertensive Elderly Patients

Lingireddy Priyanka[1], M. Rangaraja Rao[2], D. Vijaya Lakshmi[3]

[1]Junior Resident, Department of General Medicine, Mamata Medical College, Khammam, Telangana, India.

[2]Professor and HOD, Department of General Medicine, Mamata Medical College, Khammam, Telangana, India.

[3]Assistant Professor, Department of General Medicine, Mamata Medical College, Khammam, Telangana, India.

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Corresponding author: Dr. M. Rangaraja Rao

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Abstract

Introduction: Orthostatic hypotension (OH) is a common but often under-recognized condition in the elderly, associated with significant morbidity including falls and syncope. Hypertension and its treatment may further predispose individuals to OH. This study aimed to compare the prevalence of orthostatic hypotension among hypertensive and non-hypertensive elderly patients and to evaluate its associated factors.

Materials and Methods: A hospital-based comparative cross-sectional study was conducted at Mamata Medical College, Khammam, from November 2024 to November 2025. A total of 100 elderly patients aged ≥60 years were included and divided into hypertensive (n=50) and non-hypertensive (n=50) groups. Blood pressure was measured in supine and standing positions, and OH was defined as a fall in systolic BP ≥20 mmHg and/or diastolic BP ≥10 mmHg. Data were analyzed using appropriate statistical tests, with $p<0.05$ considered significant.

Results: The overall prevalence of OH was 38.0%. It was significantly higher in hypertensive patients (52.0%) compared to non-hypertensive patients (24.0%) ($p=0.003$). The prevalence of OH increased with age, showing a significant association ($p=0.041$). No significant association was observed with gender ($p=0.82$). Among OH cases, mild severity was most common (47.4%). Dizziness (63.2%) and giddiness (52.6%) were the predominant symptoms.

Conclusion: Orthostatic hypotension is highly prevalent among elderly individuals, particularly in those with hypertension and advancing age. Routine screening for OH in elderly hypertensive patients is essential for early detection and prevention of complications.

Keywords: Orthostatic hypotension, Hypertension, Elderly, Blood pressure, Prevalence.

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Introduction

Orthostatic hypotension (OH) is a common yet often under-recognized clinical condition in the elderly, characterized by a significant fall in blood pressure upon assuming an upright posture [1]. It is typically defined as a decrease in systolic blood pressure of ≥20 mmHg and/or diastolic blood pressure of ≥10 mmHg within a few minutes of standing [2]. With advancing age, physiological changes such as impaired baroreceptor sensitivity, reduced vascular compliance, and autonomic dysfunction predispose elderly individuals to abnormalities in blood pressure regulation [3]. As a result, OH becomes increasingly prevalent in geriatric populations and contributes substantially to morbidity [4]. The clinical significance of orthostatic hypotension lies in its association with a wide range of adverse outcomes, including dizziness, giddiness, syncope, falls, and consequent injuries such as fractures [5]. These manifestations can significantly impair quality of life and increase the risk of hospitalization and mortality among elderly individuals [6]. Furthermore, OH may remain asymptomatic in some patients, making it a silent yet clinically important condition that warrants routine screening, especially in high-risk groups [7]. Hypertension is one of the most common chronic conditions affecting the elderly and is frequently associated with vascular stiffness, altered autonomic function, and long-term use of antihypertensive medications [8,9]. These factors

may increase the susceptibility of hypertensive individuals to orthostatic hypotension. Additionally, certain classes of antihypertensive drugs, including diuretics and vasodilators, can exacerbate postural blood pressure changes [10]. However, the relationship between hypertension and orthostatic hypotension remains complex and variable across different populations, necessitating further comparative evaluation [11].

Given the growing elderly population and the potential clinical implications of orthostatic hypotension, it is important to understand its prevalence and associated factors in both hypertensive and non-hypertensive individuals. Early identification of OH can aid in preventing complications and optimizing patient management. Therefore, the present study aimed to compare the prevalence of orthostatic hypotension among hypertensive and non-hypertensive elderly patients and to evaluate its association with demographic and clinical variables.

Materials and Methods

This hospital-based comparative cross-sectional study was conducted in the Department of General Medicine at Mamata Medical College, Khammam, over a period of one year from November 2024 to November 2025.

The study included a total of 100 elderly patients aged 60 years and above who attended the outpatient and inpatient departments during the study period. Participants were divided into two equal groups: hypertensive (n = 50) and non-hypertensive (n = 50), based on documented history of hypertension or ongoing antihypertensive treatment. Ethical clearance was obtained from the Institutional Ethics Committee prior to commencement of the study, and informed written consent was obtained from all participants.

Inclusion criteria comprised elderly individuals aged ≥60 years who were willing to participate in the study. Patients with acute illness, severe anemia, recent blood loss, known autonomic neuropathy, neurodegenerative disorders, or those on medications known to significantly affect autonomic function (other than antihypertensive drugs) were excluded. A detailed clinical history was obtained, including demographic details, comorbidities, and symptoms suggestive of orthostatic hypotension such as dizziness, giddiness, syncope, and blurring of vision. A thorough clinical examination was performed for all participants.

Blood pressure was measured using a standardized sphygmomanometer following a uniform protocol. After the participant rested in the supine position for at least 5 minutes, baseline blood pressure was recorded. Subsequently, blood pressure was measured at 1 minute and 3 minutes after standing. Orthostatic hypotension was defined as a fall in systolic blood pressure of ≥20 mmHg and/or diastolic blood pressure of ≥10 mmHg upon standing. The severity of orthostatic hypotension was further categorized as mild, moderate, or severe based on the magnitude of blood pressure drop. All measurements were taken under similar conditions to minimize observer and procedural bias.

Data were entered into Microsoft Excel and analyzed using appropriate statistical software. Categorical variables were expressed as frequencies and percentages.

The association between orthostatic hypotension and variables such as hypertension status, age, and gender was assessed using the Chi-square test. A p-value of <0.05 was considered statistically significant. The results were presented in the form of tables and analyzed to determine the comparative prevalence and associated factors of orthostatic hypotension among hypertensive and non-hypertensive elderly patients.

Results

The study included 100 elderly participants, with the majority belonging to the 66–70 years age group (32.0%), followed by 60–65 years (28.0%), 71–75 years (22.0%), and >75 years (18.0%). Males constituted 56.0% of the study population, while females accounted for 44.0%. The distribution of participants based on hypertension status was equal, with 50.0% hypertensive and 50.0% non-hypertensive individuals (Table 1).

Table 1: Baseline Characteristics of Study Participants (n = 100)

Variable	Category	Frequency	Percentage (%)
Age (years)	60–65	28	28.0%
	66–70	32	32.0%
	71–75	22	22.0%
	>75	18	18.0%
Gender	Male	56	56.0%
	Female	44	44.0%
Hypertension Status	Hypertensive	50	50.0%
	Non-Hypertensive	50	50.0%

Orthostatic hypotension (OH) was observed in 38.0% of the study population, while 62.0% did not exhibit OH. Among those with OH (n = 38), the majority had mild severity (47.4%), followed by moderate (34.2%) and severe forms (18.4%), indicating that milder degrees of blood pressure drop were more commonly encountered in the study cohort (Table 2).

Table 2: Prevalence and Severity of Orthostatic Hypotension

Variable	Category	Frequency	Percentage (%)
Orthostatic Hypotension	Present	38	38.0%
	Absent	62	62.0%
Severity (n = 38)	Mild	18	47.4%
	Moderate	13	34.2%
	Severe	7	18.4%

A significantly higher proportion of hypertensive patients exhibited orthostatic hypotension (52.0%) compared to non-hypertensive patients (24.0%), with this difference being statistically significant (p = 0.003). The prevalence of OH increased with advancing age, from 28.6% in the 60–65 years group to 45.5% in the 71–75 years group, showing a significant association (p = 0.041). However, no significant association was observed between gender and OH, with similar proportions seen in males (39.3%) and females (36.4%) (p = 0.82) (Table 3).

Table 3: Comparison of Orthostatic Hypotension between Groups

Variable	Category	OH Present	OH Absent	Total	% with OH	p-value
Hypertension	Hypertensive	26	24	50	52.0%	**0.003**
	Non-Hypertensive	12	38	50	24.0%	
Age Group (years)	60–65	8	20	28	28.6%	**0.041**
	66–70	12	20	32	37.5%	
	71–75	10	12	22	45.5%	
	>75	8	10	18	44.4%	
Gender	Male	22	34	56	39.3%	**0.82**
	Female	16	28	44	36.4%	

Among patients with orthostatic hypotension, dizziness was the most commonly reported symptom (63.2%), followed by giddiness (52.6%). Blurring of vision (26.3%) and syncope (21.1%) were less frequently observed, suggesting that most patients presented with milder, non-specific symptoms rather than severe manifestations (Table 4).

Table 4: Symptoms among Patients with Orthostatic Hypotension (n = 38)

Symptom	Frequency	Percentage (%)
Dizziness	24	63.2%
Giddiness	20	52.6%
Blurring of Vision	10	26.3%
Syncope	8	21.1%

Discussion

In the present study, the overall prevalence of orthostatic hypotension (OH) among elderly patients was found to be 38.0%. This prevalence is relatively higher compared to several previous studies, which have reported OH prevalence ranging from 10% to 30% in elderly populations [12,13]. A systematic review has shown that approximately one in five (around 20–22%) community-dwelling older adults are affected by OH [14]. However, higher prevalence rates have also been documented in geriatric outpatient settings (up to ~35%), which is comparable to the findings of the present study [15]. The relatively higher prevalence observed in this study may be attributed to the hospital-based population, inclusion of symptomatic individuals, and standardized measurement protocol. A key finding of the present study was the significantly higher prevalence of orthostatic hypotension among hypertensive patients (52.0%) compared to non-hypertensive individuals (24.0%), with a statistically significant association (p = 0.003).

This observation is consistent with previous studies that have demonstrated a higher occurrence of OH in individuals with hypertension. For instance, Judd et al. reported that OH was more commonly present in hypertensive patients, particularly those with uncontrolled blood pressure [16]. Similarly, population-based studies have shown that hypertension is an important risk factor for OH due to vascular stiffness and impaired autonomic

regulation [17]. The use of antihypertensive medications may further contribute to postural blood pressure drops, explaining the increased prevalence in this group.

The present study also demonstrated a significant association between advancing age and orthostatic hypotension, with prevalence increasing from 28.6% in the 60–65 years group to over 44% in those above 70 years ($p = 0.041$).

This trend is in agreement with previous literature, which consistently shows that the prevalence of OH increases with age due to progressive decline in baroreceptor sensitivity and autonomic function [18]. Studies have also reported higher rates of OH in the oldest age groups compared to younger elderly populations [19]. These findings reinforce the importance of routine screening for OH in advancing age groups.

With respect to gender, no significant association was found between sex and orthostatic hypotension in the present study ($p = 0.82$), with comparable prevalence in males and females. This finding is consistent with several studies that have reported no significant gender differences in OH prevalence. However, some studies have suggested a slightly higher prevalence in females, possibly due to hormonal influences and differences in autonomic regulation, although these findings remain inconsistent [20].

Clinically, dizziness and giddiness were the most common symptoms observed in patients with OH, aligning with existing literature that identifies these as the most frequent presenting complaints, often preceding more severe outcomes such as syncope and falls.

Conclusion

The present study demonstrates that orthostatic hypotension is a common clinical condition among elderly individuals, with a notably higher prevalence in hypertensive patients compared to non-hypertensive counterparts. The occurrence of orthostatic hypotension was found to increase with advancing age, while no significant association with gender was observed. Most cases were of mild to moderate severity, with dizziness and giddiness being the predominant symptoms.

These findings highlight the importance of routine screening for orthostatic hypotension, particularly in elderly hypertensive patients, to enable early detection and prevent potential complications such as falls, syncope, and reduced quality of life.

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