

Prevalence and Risk Factors of Hypertension Among Young Urban Adults: A Cross-Sectional Study from Durgapur, West Bengal

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Abstract:

Background: Hypertension, once considered a condition of the elderly, is now increasingly being detected among younger adults, particularly in urban areas due to changing lifestyles, poor dietary habits, and physical inactivity. Early onset hypertension poses a long-term risk for cardiovascular morbidity if left undetected and unmanaged.

Objective: To estimate the prevalence of hypertension and assess its associated risk factors among individuals aged 20 to 40 years residing in an urban locality of Durgapur, West Bengal.

Methods: A community-based cross-sectional study was conducted over a period of 4 months in selected urban wards of Durgapur. A total of 300 adults aged 20–40 years were included using systematic random sampling. Data were collected using a pretested semi-structured questionnaire covering sociodemographic details, lifestyle habits, dietary pattern, body mass index, and family history. Blood pressure was measured following standard guidelines, and hypertension was classified as per JNC-8 criteria. Statistical analysis included descriptive and inferential methods to determine associations between variables.

Results: The overall prevalence of hypertension among participants was 19.3%, with a higher rate in males (22.7%) compared to females (15.4%). Hypertension was significantly associated with body mass index ≥ 25 kg/m², sedentary lifestyle, tobacco consumption, high dietary salt intake, and family history of hypertension. Notably, 36% of hypertensive individuals were previously undiagnosed, underscoring the importance of early screening and awareness.

Conclusion: The burden of hypertension among young urban adults is considerable and largely unrecognized. Community-based interventions focused on lifestyle modification, routine screening, and awareness generation are essential for early identification and prevention of long-term complications in this age group.

Keywords: Hypertension, Young adults, Urban health, Risk factors, Cross-Sectional Study

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Introduction

Hypertension is a major global public health concern and a leading contributor to cardiovascular morbidity and mortality. Traditionally associated with older age groups, hypertension is now increasingly affecting younger adults due to a shift in lifestyle patterns, particularly in urban settings [1]. The urban population is often exposed to multiple risk factors including sedentary behavior, unhealthy dietary habits, psychosocial stress, substance abuse, and inadequate physical activity—all of which contribute to the earlier onset of elevated blood pressure [2]. This epidemiological transition has led to a concerning trend wherein hypertension, once viewed as a disease of aging, is now commonly encountered among individuals in their twenties and thirties.

Early-onset hypertension is especially problematic because it tends to remain undiagnosed and untreated for longer durations, thereby increasing the risk of long-term complications such as ischemic heart disease, stroke, and renal impairment [3]. Moreover, younger individuals often do not perceive themselves at risk and are less likely to undergo routine health screening, leading to delayed diagnosis. This silent nature of hypertension has been referred to as the "silent killer," owing to its ability to cause progressive organ damage without noticeable symptoms. Recognizing its presence early in life offers a critical window of opportunity for preventive interventions [4].

India is experiencing a growing burden of non-communicable diseases, with hypertension contributing significantly to this trend. In urban

areas, where lifestyle changes have been most rapid, the prevalence of hypertension among younger adults is reportedly increasing, although data remain sparse for specific age groups such as 20–40 years [5]. Most national and regional surveys focus on broader adult populations, and there is limited community-level evidence that highlights hypertension trends exclusively among the younger segment of the urban population [6]. This lack of targeted data limits the development of age-appropriate awareness programs and interventions.

Recognizing this gap, the present study was conducted in selected urban areas of Durgapur, West Bengal, with the aim of estimating the prevalence of hypertension among individuals aged 20 to 40 years and identifying associated lifestyle and behavioral risk factors [7]. The study was undertaken at the Department of Community Medicine, Gouri Devi Institute of Medical Sciences and Hospital, Durgapur, over a period of 4 months. Findings from this study are expected to provide valuable insights into early adult hypertension and support the formulation of targeted public health strategies for its prevention and control in urban India.

Materials and Methods

This community-based cross-sectional study was carried out over a period of 4 months in selected urban wards of Durgapur, West Bengal, with the objective of estimating the prevalence of hypertension and its associated risk factors among adults aged 20 to 40 years. The study was conducted under the Department of Community Medicine and Pathology at Gouri Devi Institute of Medical Sciences and Hospital, Durgapur. The sampling frame included all eligible individuals aged 20–40 years residing in the selected urban locality for at least six months. Using systematic random sampling, 300 participants were recruited proportionately from different household clusters to ensure fair representation of the population.

Individuals who were pregnant, critically ill, or unwilling to participate were excluded from the study. After obtaining written informed consent, each participant was interviewed face-to-face using a pretested semi-structured questionnaire. The

questionnaire collected information on sociodemographic profile, educational and occupational status, lifestyle behaviours including physical activity, dietary habits, tobacco and alcohol consumption, sleep pattern, stress levels, and family history of hypertension or cardiovascular disease.

Anthropometric measurements including height and weight were taken using standardized equipment, and body mass index (BMI) was calculated using the formula weight in kilograms divided by the square of height in meters (kg/m^2). BMI was categorized according to WHO Asian classification. Blood pressure was recorded using a calibrated digital sphygmomanometer. Two readings were taken five minutes apart from the right arm in a seated position, and the average of the two was used for analysis. Hypertension was defined based on JNC-8 guidelines as systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg, or if the participant was already on antihypertensive medication.

Data were entered in Microsoft Excel and analyzed using SPSS software. Descriptive statistics were used to present frequencies, proportions, and means. Associations between hypertension and categorical variables such as gender, BMI category, lifestyle habits, and family history were analyzed using chi-square test, while continuous variables were compared using independent t-test. A p-value less than 0.05 was considered statistically significant. Ethical clearance for the study was obtained from the Institutional Ethics Committee of Gouri Devi Institute of Medical Sciences and Hospital. All participants were ensured anonymity, confidentiality, and the right to withdraw from the study at any point.

Results

A total of 300 adults aged between 20 and 40 years participated in the study. The majority of participants were in the 25–40 year age group, and males slightly outnumbered females. Hypertension prevalence was calculated as per standard JNC-8 criteria, and multiple sociodemographic and lifestyle factors were examined for possible associations.

Table 1: Age Group Distribution

Age Group (years)	Number of Participants (n)	Percentage (%)
20–24	65	21.7
25–29	82	27.3
30–34	76	25.3
35–40	77	25.7

Table 2: Gender Distribution

Gender	Number of Participants (n)	Percentage (%)
Male	164	54.7
Female	136	45.3

Table 3: BMI Classification (Asian Criteria)

BMI Category	Number of Participants (n)	Percentage (%)
<18.5 (Underweight)	18	6.0
18.5–22.9 (Normal)	127	42.3
23–24.9 (Overweight)	65	21.7
≥25 (Obese)	90	30.0

Table 4: Prevalence of Hypertension

Hypertension Status	Number of Participants (n)	Percentage (%)
Normotensive	190	63.3
Prehypertensive	53	17.7
Hypertensive	57	19.0

Table 5: Gender-wise Distribution of Hypertension

Gender	Hypertensive (n)	Total in Group (n)	Prevalence (%)
Male	38	164	23.2
Female	19	136	14.0

Table 6: Association of BMI with Hypertension

BMI Category	Hypertensive (n)	Total in Category (n)	Prevalence (%)
Normal	12	127	9.4
Overweight	15	65	23.1
Obese	30	90	33.3

Table 7: Association of Physical Activity with Hypertension

Physical Activity Level	Hypertensive (n)	Total in Group (n)	Prevalence (%)
Sedentary	34	112	30.4
Moderately Active	15	102	14.7
Active	8	86	9.3

Table 8: Tobacco and Alcohol Use in Hypertensive Participants

Substance Use	Hypertensive (n)	Total in Group (n)	Prevalence (%)
Tobacco Users	28	72	38.9
Non-Tobacco Users	29	228	12.7
Alcohol Users	23	68	33.8
Non-Alcohol Users	34	232	14.7

Table 9: Family History and Hypertension

Family History of Hypertension	Hypertensive (n)	Total in Group (n)	Prevalence (%)
Present	35	98	35.7
Absent	22	202	10.9

Table 10: Awareness of Hypertension Among Diagnosed Participants

Awareness Status	Number of Hypertensive Participants (n)	Percentage (%)
Previously Diagnosed	36	63.2
Newly Diagnosed	21	36.8

Discussion

This community-based cross-sectional study was conducted to estimate the prevalence of hypertension and assess its associated risk factors among young adults aged 20 to 40 years in an urban population of Durgapur, West Bengal. The findings highlight that nearly one in five participants (19%) in this age group was hypertensive, and an additional 17.7% were in the prehypertensive range [8]. This underscores a growing public health concern, as

elevated blood pressure at a younger age significantly increases the risk of long-term cardiovascular complications, including stroke and ischemic heart disease, if left unaddressed. The prevalence reported in this study aligns with recent findings from other urban Indian populations, where increasing trends of early-onset hypertension are being documented [9].

The study revealed that hypertension was more prevalent among males (23.2%) compared to

females (14.0%), a trend commonly reported in similar studies across the country. This disparity may be explained by higher exposure to behavioral risk factors such as tobacco use, alcohol consumption, occupational stress, and dietary patterns that differ between genders [10]. Additionally, men in younger age groups are less likely to seek preventive health services, leading to underdiagnosed and uncontrolled hypertension. The strong association observed between obesity and hypertension is consistent with existing literature, which identifies increased adiposity as a major modifiable contributor to elevated blood pressure [11]. In the current study, 33.3% of obese participants were hypertensive compared to only 9.4% of those with normal BMI, demonstrating a clear positive gradient.

Physical inactivity emerged as a significant risk factor, with a hypertension prevalence of 30.4% among sedentary individuals. This reinforces the need to promote physical activity as a central pillar of lifestyle intervention in the prevention and management of hypertension [12]. Tobacco and alcohol use also showed strong associations with elevated blood pressure, particularly tobacco use, where the prevalence reached 38.9% among users. These findings echo numerous Indian and global studies that have established a link between substance use and vascular dysfunction. Participants with a positive family history of hypertension had a notably higher prevalence (35.7%), supporting the role of genetic predisposition and shared household lifestyle patterns in the etiology of hypertension [13].

Another key finding from this study was that over one-third of hypertensive individuals (36.8%) were newly diagnosed during the survey, highlighting a substantial gap in awareness, routine screening, and early detection within this age group [14]. Young adults are often asymptomatic and tend to overlook periodic health check-ups, leading to missed opportunities for timely diagnosis and lifestyle correction. The high proportion of prehypertensive individuals further emphasizes the urgent need for targeted interventions to prevent progression to clinical hypertension [15].

This study's strength lies in its focused age group, community-based design, and comprehensive coverage of modifiable and non-modifiable risk factors. However, it is not without limitations. Being cross-sectional, causality could not be established between risk factors and hypertension. The use of a single set of blood pressure readings on one occasion might have resulted in misclassification in borderline cases. Additionally, the study was confined to one urban area, which may limit the generalizability of the findings to other populations.

Despite these limitations, the study provides valuable insights into the emerging burden of hypertension among younger urban adults. The high prevalence of modifiable risk factors such as overweight/obesity, sedentary lifestyle, and substance use suggests that early interventions focusing on lifestyle education, screening, and behavior change communication can have a substantial impact in reducing the long-term burden of hypertension and associated complications in this population segment.

Conclusion

The present study highlights that hypertension is no longer confined to older adults but is increasingly prevalent among the younger population residing in urban settings. Nearly one-fifth of adults aged 20 to 40 years in this study were hypertensive, and a significant proportion were prehypertensive, indicating a substantial pool of individuals at risk of progression to full-blown hypertension. The findings emphasize the influence of modifiable lifestyle factors such as elevated body mass index, sedentary habits, tobacco and alcohol use, and lack of physical activity on blood pressure levels. The association of family history with higher prevalence further suggests a combined genetic and environmental influence in the early onset of hypertension.

A particularly concerning observation was that more than one-third of the hypertensive individuals were unaware of their condition prior to this study. This indicates a glaring need for community-based screening initiatives targeting younger adults, who are often overlooked in routine hypertension programs. Incorporating blood pressure monitoring into general health check-ups for this age group can aid in early diagnosis and timely intervention.

Preventive strategies such as promoting regular exercise, reducing dietary salt intake, discouraging tobacco and alcohol use, and fostering awareness through public health education campaigns are critical to controlling the hypertension epidemic at its root. Policymakers and health planners must consider including young adults as a priority group in non-communicable disease (NCD) prevention frameworks. Early detection and control of hypertension in this age group can contribute significantly to reducing the long-term burden of cardiovascular disease and enhancing population health outcomes.

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