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Original Research Article

Prevalence of Hypertension and Associated Risk Factors among Adults Attending Outpatient Department: A Hospital-Based Study

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Abstract:

Background: Hypertension is a no communicable disorder that has been common in all parts of the world and is largely referred to as a silent killer because of its asymptomatic presentation and because of its association with serious cardiovascular incidents. The identification of the prevalence and risk factors on a community/hospital level provides useful information regarding preventive actions.

Methods: It was a cross-sectional study conducted at Department of General Medicine, Katihar Medical College and Hospital, Katihar, Bihar, India having 100 patients attending the OPD (adults). Sampling of patients was random and data collected via administration of structured questionnaires which comprised of socio-demographic factors, lifestyle behavior and family history. Blood pressure was measured using standard sphygmomanometer values. Per WHO (>= 140/ 90 mmHg). Statistical analysis was done to determine the correlation between the risk factors using descriptive statistics and ch-square analysis.

Results: Among 100 patients, the prevalence of hypertension was found to be 32%. Hypertension was significantly associated with increasing age ($p<0.05$), male gender, obesity (BMI ≥25), physical inactivity, smoking, alcohol consumption, and family history of hypertension.

Conclusion: Hypertension is prevalent among OPD attendees, influenced by modifiable and non-modifiable risk factors. Targeted health education and lifestyle modification strategies are crucial to reduce the burden of hypertension in the adult population.

Keywords: Hypertension, Prevalence, Risk Factors, OPD, Adults, Lifestyle.

Introduction

Hypertension, commonly referred to as high blood pressure, represents one of the foremost global public health challenges, contributing significantly to cardiovascular morbidity and mortality [1]. According to the World Health Organization (WHO), nearly one billion individuals worldwide are affected by hypertension, making it a major determinant of heart disease, stroke, renal failure, and premature deaths. The prevalence of hypertension is rising steadily across both developed and developing countries, driven by rapid urbanization, sedentary lifestyles, dietary changes, and demographic transitions, including aging populations [2]. This increasing burden poses serious challenges for healthcare systems, as uncontrolled hypertension not only increases individual health risks but also imposes substantial economic and societal costs.

In India, hypertension has emerged as a significant non-communicable disease affecting millions of individuals across urban and rural areas [3]. Urbanization has been accompanied by substantial lifestyle modifications, including decreased physical activity, increased consumption of high-calorie and high-salt diets, as well as higher rates of tobacco and alcohol use. These lifestyle changes, compounded by genetic predisposition and socio-economic factors, have contributed to the rising prevalence of hypertension in the Indian population. Epidemiological studies have consistently shown that men tend to have a higher prevalence of hypertension compared to women, although post-menopausal women experience a marked increase in risk due to hormonal changes [4]. Such patterns underscore the need to consider both demographic and physiological factors when assessing the burden of hypertension.

Hypertension is often asymptomatic, earning it the moniker “silent killer,” as many individuals remain unaware of their elevated blood pressure until

serious complications, such as myocardial infarction, stroke, or chronic kidney disease, occur [5]. This silent progression highlights the critical importance of early detection through routine screening, particularly in outpatient and primary care settings, where preventive interventions can be implemented before severe complications arise. Effective management of hypertension relies on a combination of lifestyle modifications—such as weight control, regular physical activity, reduced salt intake, smoking cessation, and moderation of alcohol consumption—alongside pharmacological therapy when indicated [6]. These approaches not only control blood pressure but also reduce the risk of long-term cardiovascular and cerebrovascular events.

The risk factors associated with hypertension can broadly be divided into non-modifiable factors, including age, gender, genetic predisposition, and family history, and modifiable factors, such as obesity, physical inactivity, tobacco and alcohol use, and unhealthy dietary habits [7]. Understanding the prevalence and impact of these factors within specific populations, particularly among adults attending outpatient services, is crucial for designing targeted prevention and intervention strategies. Localized data allows healthcare providers and policymakers to prioritize high-risk groups, develop educational initiatives, and implement community-based interventions aimed at reducing the overall burden of hypertension.

Several studies conducted in India have documented the prevalence of hypertension across different regions and populations. For instance, Gupta et al. (1995) reported a prevalence of 30% among urban adults in Jaipur, while the Chennai Urban Population Study (CUPS) by Mohan et al. (2003) identified lifestyle and demographic factors, including obesity and physical inactivity, as significant determinants of elevated blood pressure [8,9] Despite these studies, considerable variability exists in the prevalence of hypertension across geographic regions, age groups, and socio-economic strata, highlighting the need for ongoing, localized research to inform effective public health policies. Such studies are essential not only for understanding the current epidemiology of hypertension but also for guiding preventive strategies, early detection programs, and resource allocation in healthcare systems.

Overall, hypertension continues to pose a substantial health challenge in India and across the globe, largely due to its high prevalence, silent progression, and strong association with life-threatening cardiovascular and renal complications. The condition arises from a complex interplay between modifiable risk factors, such as obesity, physical inactivity, unhealthy dietary habits, tobacco and alcohol use, and non-modifiable factors, including age, gender, and genetic predisposition. This intricate relationship underscores the multifactorial nature of hypertension, making prevention and management strategies more challenging yet crucial for public health. Targeted research that focuses specifically on outpatient populations offers valuable insights into these demographic and lifestyle patterns, enabling healthcare providers to identify high-risk groups and tailor interventions more effectively. By understanding the distribution of risk factors and the prevalence of hypertension within specific communities, policymakers and clinicians can design comprehensive prevention programs, implement early detection measures, and promote health education initiatives.

Such efforts are essential not only for reducing the incidence and complications of hypertension at an individual level but also for alleviating the broader societal and economic burden associated with this chronic condition. Ultimately, these focused research initiatives contribute to evidence-based strategies that enhance cardiovascular health outcomes, improve quality of life, and reduce long-term healthcare costs in both urban and rural populations.

Materials and Methods

Study Design: It was a cross-sectional observational study, which was conducted in a hospital setting to establish the prevalence of hypertension and examine the risk factors related to hypertension among adult patients who visited the Outpatient Department (OPD) of Department of General Medicine, Katihar Medical College and Hospital, Katihar, Bihar, India

Study Period and Setting: This research was carried out within a one-year (from January 2005 to December 2005) timeframe within the General Medicine OPD of Katihar Medical College and Hospital, Bihar, India. The OPD has both an urban and semi-urban population, which gives it a representative sample of adults who come to the hospital with routine or minor health-related issues.

Sample Size: One hundred adult patients aged 18 years and above were recruited into the research. This sample size was arrived at in light of feasibility, hospital attendance and past researches involving prevalence of hypertension in similar hospital settings. Simple random sampling was used in our selection of patients to reduce selection bias.

Inclusion and Exclusion Criteria: The study involved adult patients of 18 years and above, who presented themselves in the outpatient department (OPD) of any reason, as long as they had written informed consent to participate. Patients were also excluded on basis of pregnancy because pregnancy induced hypertension might confuse the findings, the patient had to be critically ill and needed urgent hospitalization, or had known secondary causes of hypertension, which include renal artery stenosis or

endocrine conditions. These inclusion criteria helped to ensure that the sample used in the study was suitable to measure primary hypertension and its risk factors and to reduce confounding factors.

Data Collection Procedure

- Demographic and Clinical Data: Demographic information, including age, gender, occupation, socio-economic status, family history of hypertension and lifestyle-related factors (smoking, alcohol use, physical activity), and diet were collected by using a structured questionnaire.
- Anthropometric and Blood Pressure Measures: Height and weight were taken using conventional techniques and Body Mass Index (BMI) was calculated as weight (kg)/height 2 (m 2) and obesity was taken as BMI 25 kg/m 2 and above among Asian populations. Blood pressure was measured in a sitting posture using a normal mercury sphygmomanometer at the culmination of a 5 minutes rest interval then two measurements that must not be less than 5 minutes apart were taken and averaged to analyse. Hypertension was grouped as per JNC VII (2003) where systolic BP was 140mmHg, diastolic BP was 90 mmHg or antihypertensive medication.
- Risk Factor Analysis: The physical inactivity (less than 150 minutes in moderate physical activity per week), smoking (current, former or never) and alcohol use (current, former or never) were considered as the risk factors in the lifestyle. Families with positive family history included those that had parent(s) or sibling(s) with hypertension.

Statistical Analysis: The descriptive statistics, including mean, standard deviation, frequency and percentage were employed to describe the demographic and clinical characteristics of the research population. The correlation between hypertension and categorical risk factors such as gender, obesity, smoking, alcohol consumption, physical activity and a family history were determined by chi-square tests, the p-value of which was less than 0.05 was considered significant.

Results

The objective of the current research was to determine the prevalence of hypertension and evaluate the risk factors which are related to the prevalence in 100 adult patients in the outpatient department (OPD). The analysis was done in numerous dimensions, which included demographics, gender distribution, age-related factors and how modifiable and non-modifiable risk factors influence the levels of blood pressure. The methodical review of these would assist the research in providing a deeper understanding of the burden of hypertension in this specific population, in addition to determining the key determinants that may be linked to the onset and exacerbation of high blood pressure. These lessons are particularly useful in availing specific preventive measures, early detection schemes and personalized management schemes that are high risk-focused. The following tables summarize these findings and will help illustrate the distribution of the patients in terms of age and gender, prevalence of hypertension according to the age group, as well as statistical relationship between various risk factors and high blood pressure and will therefore provide a clear picture of determinants and patterns of hypertension among this outpatient population.

Table 1: Distribution of Patients by Age Group

Age Group (years)	Number of Patients	Percentage (%)
18–30	20	20
31–40	25	25
41–50	40	40
51–60	10	10
>60	5	5

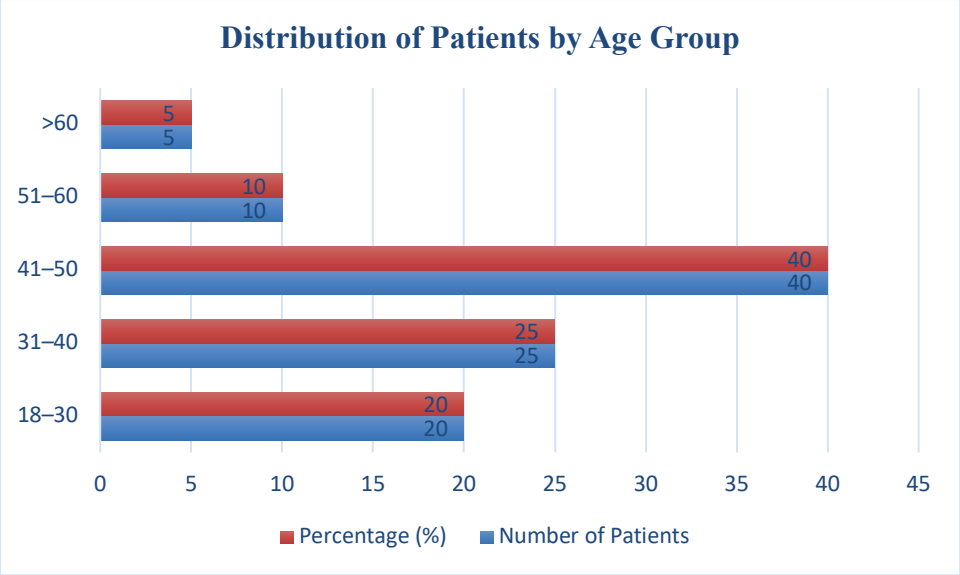

Figure 1: Distribution of Patients by Age Group

The table shows the age distribution of the patients which gives an insight into the demographic profile of the study population. A majority of the patients, 40 per cent, are aged between 41 and 50 years, which means that middle-aged adults constitute a huge part of the outpatient population. It is subsequently followed by 25 percent of patients aged 31-40 years and 20 percent aged 18-30 years, which means that the younger generation and early middle-aged those are also significantly represented. Conversely, the patients of lower age groups were found to be fewer with 10 percent in the 51-60 years bracket and only 5 percent above that. These results indicate that despite the wide age distribution among the study population, middle-aged people (3150 years) are the most common group, and it might be significant in the context of determining the risk trend of hypertension along with other health-related lifestyle limitations.

Table 2: Distribution of Hypertension by Gender

Gender	Hypertensive	Non-hypertensive	Total
Male	18	38	56
Female	14	30	44
Total	32	68	100

The table outlines the hypertension distribution among the patients based on the gender, which provides information on the possible differences in prevalence between the genders. Out of the 100 patients comprising the study, 32 were found to have been hypertensive and 68 of them were non-hypertensive. Among the male participants, 18 of them (32.1%) were hypertensive and 38 (67.9%) were non-hypertensive, and among the female participants, 14 (31.8) participants were hypertensive and 30 (68.2) were non-hypertensive. Such results suggest that the incidence of hypertension is a little greater in males than females, but, overall, the balance between hypertensive and non-hypertensive groups is relatively equal in both sexes. This implies that although gender might be a minor factor that increases the risk of getting hypertension, both men and women in this group are equally affected and preventive measures against blood pressure screening and preventive interventions should be considered a routine irrespective of gender.

Table 3: Prevalence of Hypertension Across Different Age Groups

Age Group (years)	Hypertensive	Percentage (%)
18–30	2	10
31–40	5	20
41–50	15	37.5
51–60	6	60
>60	4	80

Note: The >60 group had only 5 participants, of whom 4 were hypertensive.

The incidence of hypertension in various age groups, indicating an apparent tendency of the

increasing risk with advancing age. The prevalence of hypertension among the youngest age group, 1830 years, was 10 percent, which is a fairly low estimate of the burden of high blood pressure in young adulthood. This increases to 20% in the 31-40 years age group, a slow growth as they age into the middle age. A significant increase in risk is shown by the percentage of patients with hypertension in the 41 to 50 years category, which is the mainstream middle-aged population, at 37.5%. The trend is more pronounced in the older age groups with 60% of patients aged 51-60 years and 80% of those aged over 60 years reported to be hypertensive. These results highlight that there is a positive correlation between hypertension and age which is very high and high level of advancing age is a major non-modifiable risk factor.

Table 4: Association of Risk Factors with Hypertension

Risk Factor	Hypertensive (%)	p-value
Obesity (BMI ≥25)	57.1	<0.001
Physical inactivity	56	<0.001
Smoking	50	0.014
Alcohol consumption	48	0.045
Family history of HTN	80	<0.001

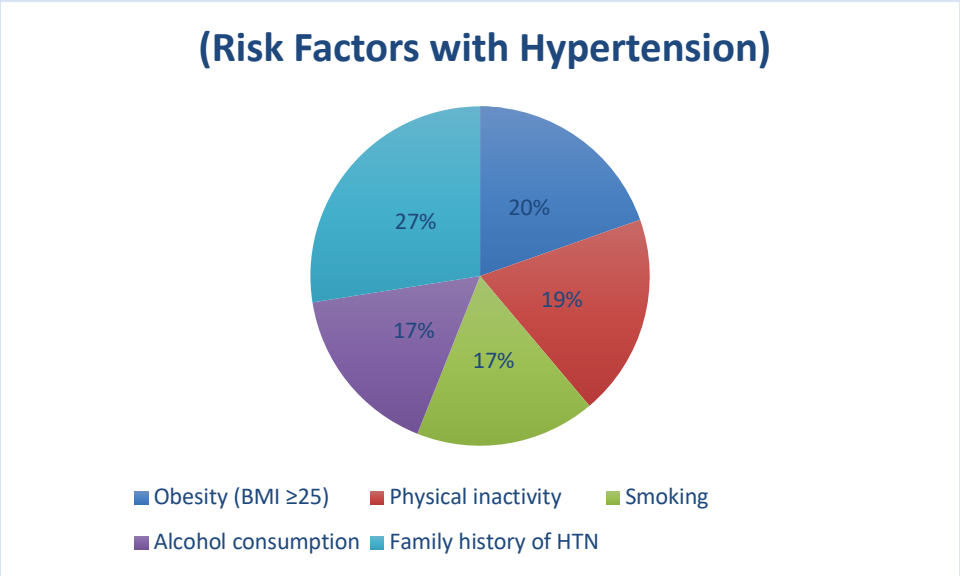

Figure 2: (Risk Factors with Hypertension)

The high incidence of hypertension of patients with a range of risk factors and indicates the statistical significance of these relationships. The highest prevalence of hypertension was noted in patients with a positive family history with 80% of affected individuals carrying the gene therefore expressing a high genetic predisposition. Obesity was a key modifiable risk factor, with 57.1% of obese individuals having hypertension with physical inactivity being a close second with 56% of sedentary individuals. Smoking and alcohol use were also identified as lifestyle habits, which increase blood pressure with prevalence rates of 50 and 48 percent, respectively, indicating that the habits also contribute to further cardiovascular risk. All these correlations are statistically significant ($p < 0.05$), but the family history, obesity and physical inactivity indicate very high levels of significance ($p < 0.001$). Such results highlight the importance of genetic as well as lifestyle factors in pathogenesis of hypertension and the necessity of effective risk analysis and treatment options to address modifiable behaviors and keep an eye on high-risk individuals according to the family history.

Discussion

Hypertension is a key global health issue, which tends to develop silently and is not always detected until it develops severe complications such as stroke, heart attack, or failure of the kidney, which may result in severe outcomes [10]. In the current hospital-based study of 100 outpatient department (OPD) patients of adult age, the prevalence of hypertension was reported to be 32%. This prevalence is similar to the previous research in urban India as it is reflective of the same burden of high blood pressure among the urban population. This is because hypertension is a silent disease, therefore early diagnosis is important and the findings underscore the need to conduct frequent screening exercises in clinical practices to avoid

cardiovascular and renal diseases in the long term [11].

It was found that that there was a definite tendency of rise in prevalence of hypertension as age advanced and the highest prevalence was observed among patients whose age exceeded 50 years [12]. This tendency is in tandem with both global and Indian research, which, regularly, reveals that age is both a non-modifiable risk factor highly correlated with increased blood pressure. The data also showed that there was a slight male preponderance whereby 56 percent of hypertensive patients were males. This finding aligns with the previous literature that has reported an increased risk of hypertension in men especially before they reach menopause after which the differences in prevalence between the genders become more similar [13]. The results indicate that age and gender are significant factors in epidemiology of hypertension, and that, the awareness activities are to be directed towards high-risk age groups, with an awareness of gender differences in risk factors.

In this study, obesity was a major factor that was linked to hypertension. Out of the participants with a body mass index (BMI) of 25kg/m 2 and above, 57 percent were hypertensive with only 21 percent of the non-obese participants experiencing high blood pressure [14]. This observation conforms with the previous studies among urban Indian populations, including the one by Mohan et al. (2003) who found a strong positive relationship between BMI and blood pressure. Besides obesity, other lifestyle habits such as sedentary lifestyles and lack of physical activity were very strongly associated with hypertension. The findings underscore the importance of behaviors that can be changed to prevent and treat high blood pressure and the need to promote active lifestyles among individuals in cities to check the increasing prevalence of hypertension [15].

Hypertension also was considered to be strongly linked to tobacco use and consumption of alcohol [16]. The hypertensive patients were half of those who smoked and 48 percent of the alcohol consumers had high blood pressure. These results are in line with the current body of literature which dictates that smoking, and high alcohol consumption are both causes of endothelial dysfunction, hyperactivity of the sympathetic nervous system as well as an increased risk of developing cardiovascular diseases. The evidence shows that smoking-quitting and alcohol-moderating behavioral interventions are crucial elements of hypertension management programs and might help to decrease long-term cardiovascular morbidity among populations at risk considerably [17].

The study found that family history was a very viable predictor of hypertension. Eighty percent of the participants who had a positive family history of hypertension were reported to be hypertensive, which means that they are highly predisposed genetically. This observation is consistent with previous studies carried out by Gupta et al. (1995), and Kannel (1996) and it highlights the role of genetic predispositions in the occurrence of hypertension. Early identification of hypertension in individuals with a family history of hypertension gives a chance to identify the problem at an early stage and prevent or postpone the development of hypertension and related complications [18].

The results of the study are comparable to the data of other studies, both nationally and in the world. A prevalence of 30 percent among adults in India was reported in urban studies of Gupta et al. (1995), which is comparable to the 32 percent prevalence in the present study. Likewise, the Urban Population Study (CUPS) gave the prevalence of hypertension as 25 35% with significant correlation with obesity and sedentary lifestyles as we observed. Considering a global view, the trends found in this paper can be linked to the guidance provided by World Health Organization-International Society of Hypertension (WHO-ISH) that highlights how prevalence of hypertension increases with age and lifestyle. These comparisons support the topicality of the research and the necessity of the internationally and locally applicable interventions.

The results of this research are important to the health of the population. Hypertension screening in the OPDs, especially among the older individuals and those with risk factors that can be identified, is important to detect early and manage it [19,20]. The weight control, physical activity, smoking cessation, and alcohol consumption moderation programs should be incorporated in health education to decrease the number of cases of hypertension and related problems. Moreover, timely interventions may be promoted by identifying high-risk people on the basis of family history and, thus, decreasing the burden of cardiovascular disease, and enhancing population health outcomes.

The study possesses a number of strengths such as, structured methodology with standard blood pressure measures and inclusion of both modifiable and non-modifiable risk factors. Nevertheless, it has certain limitations. The study is a hospital-based study and thus the findings might not be a complete reflection of hypertension prevalence in the community. The sample size (100 patients) was also small and it might not represent the generalizability of the results. Also, the cross-sectional nature of the study does not allow the inference about causality between the risk factors and hypertension. Irrespective of these shortcomings, the research can help us understand the prevalence and determinants of hypertension in adult OPD patients and the need to have targeted preventive measures.

Conclusion

The current hospital study with 100 adult outpatient department (OPD) patients showed that 32 percent of the respondents were hypertensive, with hypertension being a major issue in the public health. Increasingly over age, and marginally higher in males as observed in the previous epidemiological evidences. Sedentary lifestyle, smoking, alcohol consumption, and obesity as modifiable risk factors and age and positive family history as non-modifiable factors were significantly related to high blood pressure, which highlights the multifactorial nature of hypertension. These results highlight the significance of early diagnosis and regular screening in outpatient and community care in order to detect high-risk people prior to the emergence of severe cardiovascular events. Lifestyle changes, including healthy body weight, physical activity, quitting smoking, and alcohol consumption moderation, among specific intervention and counseling targeting those who have a family history of hypertension can significantly decrease the disease burden and its complications. Hospital-based surveillance does not only help in identifying at-risk patients but also forms the basis of associated preventive measures, health education interventions, and effective resource allocation, and at the end of the day, leads to better cardiovascular health and decreased morbidity within the society.

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