

## PREVALENCE OF HYPERTENSION AMONG PRE-ELDERLY PATIENTS ATTENDING PERIPHERAL HEALTH CENTRE OF TERTIARY CARE HOSPITAL OF INDIA

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**Article Info:** Received 24 October 2019; Accepted 18 November. 2019

**DOI:** <https://doi.org/10.32553/ijmbs.v3i11.733>

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**Conflict of interest:** No conflict of interest.

### Abstract

**Background:** In this modern era, chronic noncommunicable diseases (NCDs) are a major global health challenge with numerous grave complications on the human body. Hypertension is the most common disorder which is being encountered in the outdoor patients

**Method:** This cross sectional study was undertaken to provide the data on the prevalence of hypertension amongst patients who were aged 20 years and above (pre elderly) and who attended the Out Patients Department of the Rural Health & Training Centre of tertiary care hospital of Chandigarh city of India.

**Results:** Association of age with systolic blood pressure & diastolic pressure was found to be highly significant ( $P < 0.001$ ). On the other hand association gender with systolic blood pressure & diastolic blood pressure was also found to be highly significant ( $P < 0.001$ ). Logistic regression was also applied & it was found that age and male gender is a better predictor of diastolic hypertension but it was found to be non-significant ( $P > 0.05$ ).

**Conclusion:** Hypertension was found to be highly prevalent among the outdoor patients of Rural Health & Training Centre of Chandigarh, India. This study warrants the need of an early detection of hypertension, which can be accomplished by a periodic screening of the people.

**Key words:** Hypertension; India.

### Introduction

In this modern era, chronic noncommunicable diseases (NCDs) are a major global health challenge with numerous grave complications on the human body. NCDs kill 40 million people each year, equivalent to 70% of all deaths globally. Each year, 15 million people die from a NCD between the ages of 30 and 69 years; over 80% of these premature deaths occur in low and middle income countries<sup>[1]</sup>

Hypertension is the most common disorder which is being encountered in the outdoor patients<sup>[2]</sup>. It is an established major risk factor and a leading cause of cardiovascular diseases worldwide. The prevalence of hypertension and its complications are increasing in the developing countries<sup>[3]</sup>. Cardiovascular diseases will be the largest cause of death and disability in India by 2020<sup>[4]</sup>. The economic development,

changes in the lifestyle and diet, and an increase in the life expectancy may be attributed to this rapid increase. Hypertension is an iceberg disease. The proportion of the awareness, treatment, and the control of hypertension are unacceptably low in the Indian adult population, as indicated from a plethora of studies<sup>[5-8]</sup>.

Thus, hypertension is emerging out as a major public health problem. The prevalence of hypertension has significantly increased more among urban communities than rural people. The prevalence of hypertension will increase even further, unless broad and effective preventive measures are implemented. Prevention programmes and policies are in their infancy in India. Epidemiological studies are urgently needed to assess the prevalence of hypertension to determine the baseline, against which the future trends in the risk factor levels can be assessed and

preventive strategies can be planned to promote health among the populations.<sup>[9]</sup>

The present study was undertaken to provide the data on the prevalence of hypertension amongst patients who were aged 20 years and above (pre elderly) and who attended the Out Patients Department of the Rural Health & Training Centre of tertiary care hospital of Chandigarh city of India.

#### **Material and Methods:**

**Study Type:** Observational secondary data based study

**Study Duration:** May 2018 to August 2018 covering a total of 987 (Male 339 & Female 648) patients aged 20 to 59 years.

**Study Population:** All the patients visited RHTC (Rural Health Training Centre) of GMCH (Govt. Medical College & Hospital), Chandigarh, India, aged 20 to 59 years.

**Study Sample:** A total of 987 patients were selected as sample size, who visited the RHTC during study period.

#### **Participant Recruitment:**

- Inclusion criteria: All the adults who were aged 20 to 59 years, who attended the Rural Health Training Centre of Govt. Medical College & Hospital, Chandigarh, India.
- Exclusion criteria: All the participants who were aged less than 20 years of age were excluded from the study. The patients who were non co-operative and those who refused to provide the necessary information were also excluded.

#### **Data Collection:**

This study was conducted between May 2018 and August 2018. A total of 987 patients (339 males, 648 females) gave their consent and participated in the study. A structured, pretested schedule was used to collect the data with regards to the socio-demographic characteristics and the blood pressure pattern. Blood pressure was measured by the trained staff in a bid to avoid any measurement bias. Calibrated BP instrument was used throughout the study period in a bid to curtail any instrumental bias. Two measurements of the blood pressure of each study participant were made 30 minutes apart, with the participants in the sitting position, by using a

mercury column sphygmomanometer. The blood pressure measurements were made on the subject's left arm by using a cuff of the appropriate size, at the level of the heart. The cuff pressure was inflated 30 mm Hg above the level at which the radial pulse disappeared and then it was deflated slowly at the rate of about 2mm per sec. In the cases where the two readings differed by over 10 mm of Hg, a third reading was obtained, and average of three measurements was taken. The pressures, at which the sound appeared and disappeared, were taken as the Systolic Blood Pressure (SBP) and the Diastolic Blood Pressure (DBP) respectively.

#### **Operational Definitions:<sup>[10]</sup>**

- Persons in the age group of 18–59 years having systolic BP  $\geq 140$  mmHg and diastolic BP  $\geq 90$  mmHg or any level of BP in patients taking antihypertensive medication were considered as hypertensive.
- Persons in the age group of 60 or more than 60 years having systolic BP  $\geq 150$  mmHg and diastolic BP  $\geq 90$  mmHg or any level of BP in patients taking antihypertensive medication were considered as hypertensive.

#### **Data processing and analysis:**

Data collected were compiled and analyzed using suitable Statistical Software. The study was done using 95% confidence level.  $P < 0.05$  was considered statistically significant. Pearson's Chi-square test was used to evaluate differences between groups for categorized variables. Predictors of hypertension were also measured using Logistic regression.

#### **Results:**

This study was conducted on Pre elderly Patients (Age 20 to 59 years) visited the Rural Health and training Centre of Govt. Medical College and Hospital Chandigarh. During the study period a total of 742 patients visited the health facility. Out of these all patients majority of patients were females (68.05%) and by far age distribution is concerned more or less equal distribution was observed among all age groups. Association of age with systolic blood pressure was found to be highly significant ( $P < 0.001$ ). On the other hand association gender with systolic blood pressure was also found to be highly significant ( $P < 0.001$ ). (Table: 1)

**Table 1:** showing Association of socio demographic characteristics with systolic blood pressure

Age group (in years)	Systolic Blood pressure (in mmHg)				Total N(%)
	<120 N (%)	120-139 N(%)	140-159 N(%)	>160 N(%)	
20-59	148(83.1)	27(15.2)	3(1.7)	0 (00)	178 (23.98)
30-39	84(57.5)	52(35.6)	9(6.2)	1(0.7)	146 (19.67)
40-49	88(46.6)	75(37.9)	22(1.1)	13(6.6)	198(26.68)
50-59	80(36.4)	89(40.5)	38(17.3)	13(5.9)	220 (29.64)
<b>Total</b>	400 (53.9)	243 (32.7)	72(9.7)	27(3.6)	742 (100)
<b>Chi square: 112.01 &amp; P value: 0.00001 ( &lt; 0.001)</b>					
<b>Gender</b>					
Male	89 (37.5)	94 (39.6)	39(16.4)	15(6.3)	237 (31.94)
Female	311(61.6)	149(29.5)	33(6.5)	12(2.4)	505 (68.05)
<b>Total</b>	400 (53.9)	243 (32.7)	72(9.7)	27(3.6)	742 (100)
<b>Chi square: 45.65 &amp; P value: 0.0000 ( &lt; 0.001)</b>					

Study has also tried to find out Association of diastolic blood pressure with age and gender. Highly significant association was found out of diastolic blood pressure with both age (P < 0.001) and Gender respectively (P < 0.001). (Table: 2)

**Table 2:** showing Association of socio demographic characteristics with diastolic blood pressure

Age group (in years)	Diastolic Blood pressure (in mmHg)				Total N(%)
	<80 N(%)	89-89 N(%)	90-99 N(%)	>100 N(%)	
20-59	134(75.3)	37(20.8)	5(2.8)	2(1.1)	178 (23.98)
30-39	89(61.0)	46(31.5)	8(5.5)	3(2.1)	146 (19.67)
40-49	97(49.0)	60(30.3)	27(13.6)	14(7.1)	198(26.68)
50-59	84(38.2)	80(36.4)	41(18.6)	15(6.8)	220 (29.64)
<b>Total</b>	404(54.4)	223(30.0)	81(10.9)	34(4.6)	742 (100)
<b>Chi square: 74.99 &amp; P value: 0.00001 ( &lt; 0.001)</b>					
<b>Gender</b>					
Male	98(41.3)	70(29.5)	47(19.8)	22 (9.3)	237 (31.94)
Female	306 (60.6)	153(30.3)	34(6.7)	12 (2.4)	505 (68.05)
<b>Total</b>	404(54.4)	223(30.0)	81(10.9)	34(4.6)	742 (100)
<b>Chi square: 53.14 &amp; P value: 0.00001 ( &lt; 0.001)</b>					

By far prevalence of hypertension among age groups is concerned majority of patients belonging to age group 40-49 years and 50-59 years were found to be either systolic hypertensive ( 18.4%) or diastolic hypertensive (32.2%). Logistic regression was also applied & it was found that Age is a better predictor of diastolic hypertension but it was found to be non-significant (P > 0.05). (Table: 3)

**Table 3:** Logistic regression for independent predictor (Age) of hypertension

Age group (in years)	Systolic Hypertension	Diastolic Hypertension	Total	aOR [95% CI]	P value
20-59	3(1.7)	5(2.8)	178 (23.98)	1(Reference)	
30-39	9(6.2)	8(5.5)	146 (19.67)	0.53[0.10-2.98]	0.774
40-49	22(1.1)	27(13.6)	198(26.68)	0.74[0.16-3.43]	0.994
50-59	38(17.3)	41(18.6)	220 (29.64)	0.65[0.14-2.90]	0.841
<b>Total</b>	72(9.7)	81(10.9)	742 (100)		
<b>Chi square: 0.66 &amp; P value: 0.883 ( &gt; 0.05)</b>					

By far prevalence of hypertension among gender is concerned male patients were found to be either systolic hypertensive (16.4%) or diastolic hypertensive (19.8 %). Logistic regression was also applied & it was found that gender is not a significant predictor of hypertension (P > 0.05). (Table: 4)

**Table 4:** Logistic regression for independent predictor (Gender) of hypertension

Gender	Systolic Hypertension	Diastolic Hypertension	Total	aOR [95% CI]	P value
Male	39(16.4)	47(19.8)	237 (31.94)	0.85[0.45-1.62]	0.752
Female	33(6.5)	34(6.7)	505 (68.05)		
<b>Total</b>	<b>72(9.7)</b>	<b>81(10.9)</b>	<b>742 (100)</b>		
<b>Chi square: 0.23 &amp; P value: 0.631 (&gt; 0.05)</b>					

**Discussion:**

The prevalence of hypertension ranged from 5-15% between 1960-1990<sup>[11]</sup>. It had increased to 20-36% in the past decade<sup>[12]</sup>. The factors which were attributable to this rising trend were the rapid urbanization, lifestyle changes, dietary changes and the increased life expectancy. The high prevalence of hypertension (44.46%) in the current study, confirmed this increasing trend. A compatible prevalence of hypertension was reported (46%) in a study which was conducted among the outdoor patients of an urban health center of Kolkata<sup>[13]</sup>.

This observational study was conducted on Pre elderly Patients (Age 20 to 59 years) visited the rural health and training center of Government Medical College and Hospital Chandigarh. During the study period a total of 742 patients visited the health facility.

This study has found out that age and gender was highly significantly associated with systolic blood pressure. More or less same kind of observation was also noticed with diastolic blood pressure where age and gender were highly associated.

Prakash J et al also found significant association of hypertension with the age group in a Rohtak based study.<sup>[14]</sup>

Similarly, statistically significant association of hypertension with age group was observed in studies by Abu-Aisha et al<sup>[15]</sup>, Ganesh et al<sup>[16]</sup>, Ramakrishnan et al<sup>[17]</sup>, Dhungana et al<sup>[18]</sup> among general population of age group 18–70 years in Kathmandu, Nagammanavar et al<sup>[19]</sup> among bank employees of Bellary city, Karnataka, and Ismail et al<sup>[20]</sup>.

The proportion of hypertension, as well as the mean systolic and diastolic blood pressures, were found to increase steadily with an increase in age. These findings were coherent with those which had been reported in the studies which were conducted among the urban adults of Mumbai<sup>[21]</sup> and Lucknow<sup>[22]</sup>. Such changes of blood pressure with age, might be due to the changes in the vascular system. Cross-sectional surveys, as well as prospective observational cohort studies, have consistently demonstrated a positive relation between the age and blood pressure in most of the populations, with diverse geographical, cultural and socioeconomic characteristics<sup>[23]</sup>.

This study has found out that hypertension (both systolic & Diastolic variant) was more prevalent among age group of 40 to 59 years. More or less same kind of observation was also noticed in a study conducted by Mehmood SE et al.<sup>[9]</sup>

Age of patients was also not found to be a significant predictor of systolic hypertension in this study. On contrary study conducted at Rohtak by Prakash J et al<sup>[14]</sup> & study conducted by Mehmood SE et al<sup>[9]</sup> at Lucknow has found age as an independent significant predictor of hypertension.

Prevalence of hypertension (both systolic & diastolic variant) among male patients was found to be almost double as compared to female patients and gender was also not found to be a significant predictor of systolic hypertension. Study conducted at Lucknow<sup>[9]</sup> has found prevalence of hypertension more among females contrary to our study. But they have observed same finding for gender as not a significant predictor of hypertension which was in coherence to our study.

Comparable observations (48.4% in females and 47.5% in males) were reported among the urban adults of Mumbai<sup>[21]</sup>. A female preponderance was also observed by Kabir et al., among the outdoor patients of Dhaka Medical College<sup>[24]</sup>. In contrast, a greater proportion of hypertension was observed among males (42.9%) as compared to females (34.2%), among the urban adults of Lucknow, India<sup>[22]</sup>.

Hospital based study, single day measurement of blood pressure without taking history of other potential confounders were some of the limitation of this study.

**Conclusion:**

Hypertension was found to be highly prevalent among the outdoor patients of Rural Health & Training Centre of Chandigarh. This study warrants the need of an early detection of hypertension, which can be accomplished by a periodic screening of the people, regularly at the hospital as well as at the community levels.

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