

# Assessment of Variations Occurring in Blood Pressure of Urban Elderly Population: An Institutional Based Study

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## ABSTRACT

**Background:** Hypertension is one of the most common risk factors for cardiovascular disease. It already affects more than one billion people worldwide, leading to heart attacks and strokes. Hypertension is one of the most common morbidity in the older age groups significantly impacting their health conditions. Globally, 7.1 million deaths per year are attributable to hypertension among the estimated 1 billion individuals suffering from the condition.

**Aim of the Study:** To assess variation occurring in blood pressure of urban elderly population.

**Materials and Methods:** The present study was conducted in Department of Physiology, Krishna Mohan Medical College and Hospital, Mathura, Uttar Pradesh, India. A total of 100 patients were included in the study. Hypertensive patients with age more than 65 years were included. An informed written consent was obtained from each participant before starting the study.

**Results:** Males were 62 in number and females were 38. The mean age of study population was 72.56 years and mean BMI was 26.35 kg/m<sup>2</sup>. It was observed that systolic and diastolic blood pressure were elevated in study population as compared

to controls. However, on comparing the results were found to be statistically non-significant.

**Conclusion:** Within the limitations of the current study, this can be concluded that the blood pressure is elevated in old population in the urban areas. This can be attributed to increased stress of the urban life.


**Keywords:** Blood Pressure, Hypertension, Urban, Elderly.

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## Article History:

**Received:** 03-08-2018, **Revised:** 27-08-2018, **Accepted:** 19-09-2018

Access this article online	
Website: <a href="http://www.ijmrp.com">www.ijmrp.com</a>	Quick Response code 
DOI: 10.21276/ijmrp.2018.4.5.088	

## INTRODUCTION

Hypertension is one of the most common risk factors for cardiovascular disease.<sup>1</sup> It already affects more than one billion people worldwide, leading to heart attacks and strokes.<sup>2</sup> Complications from hypertension account for 9.4 million deaths worldwide every year.<sup>3</sup> Hypertension is one of the most common morbidity in the older age groups significantly impacting their health conditions.<sup>4</sup>

According to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC-7), hypertension affects more than two-thirds of individuals aged 65 years and above.<sup>5,6</sup> Globally, 7.1 million deaths per year are attributable to hypertension among the estimated 1 billion individuals suffering from the condition.<sup>5</sup> Suboptimal Blood Pressure (BP) (>115 mmHg) has been considered to be the most important attributable risk factor for deaths worldwide.<sup>6</sup>

Despite the gravity of the consequences, the awareness of the population about this silent killer is unsatisfactory. In the US, the awareness of hypertension is only 70%, treatment received is 59%, and controlled hypertension is only 34%.<sup>5</sup> Hence, the present study was conducted to assess variation occurring in blood pressure of urban elderly population.

## MATERIALS AND METHODS

The present study was conducted in Department of Physiology, Krishna Mohan Medical College and Hospital, Mathura, Uttar Pradesh, India. A total of 100 patients were included in the study. Hypertensive patients with age more than 65 years were included. An informed written consent was obtained from each participant before starting the study. A total of 50 young individuals in the age range of 18-45 years without any comorbidities were selected as controls.

**Measurement of Blood Pressure**

Upon visit, resting blood pressure was measured thrice with a 1minute interval using an electronic sphygmomanometer. Systolic and diastolic blood pressures were recorded on relaxed calm participants in the sitting position with their elbows raised at the level of their heart. They were instructed to abstain from eating, drinking alcohol or caffeinated drinks or exercise at least for 30

min before blood pressure measurement. The average of last two readings was used to define systolic and diastolic blood pressures.

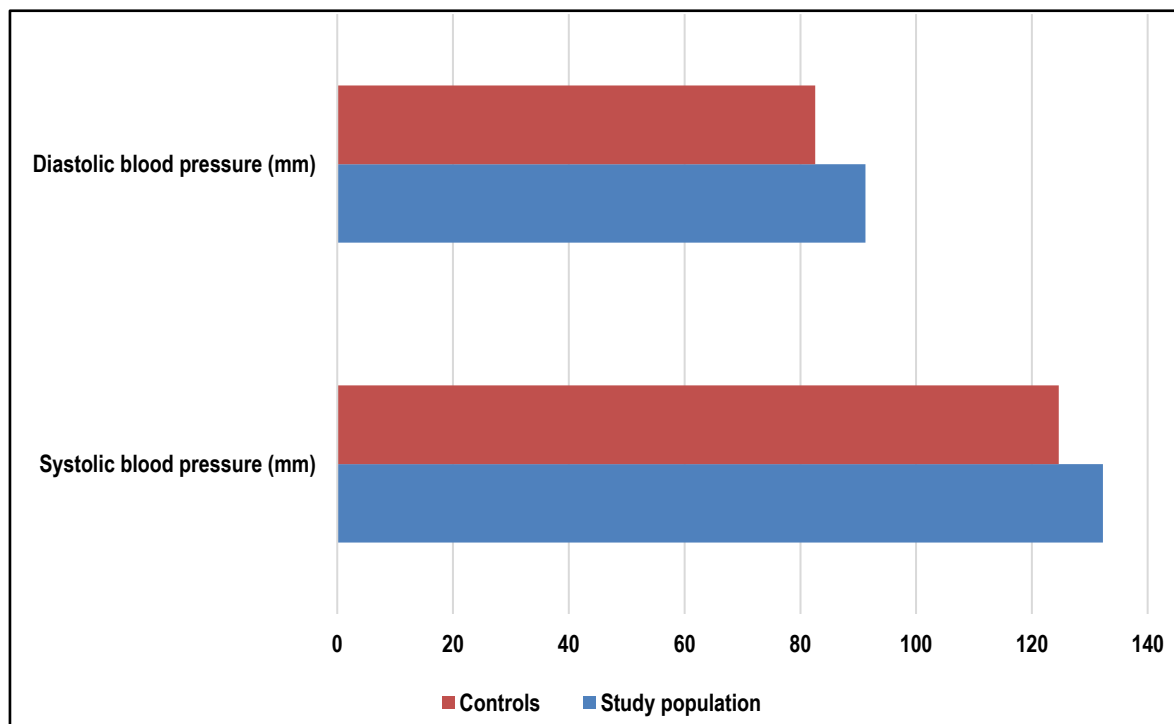
The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student's t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistically significant.

**Table 1: Demographic variables of study population**

Variables	No of patients	p-value
Male patients	62	0.12
Female patients	38	0.6
Mean age (years)	72.56	0.58
Mean BMI (kg/m <sup>2</sup> )	26.35	0.5

**Table 2: Mean systolic and diastolic blood pressure in study population and controls**

Mean blood pressure	Study population	Controls	p-value
Systolic blood pressure (mm)	132.25	124.65	0.09
Diastolic blood pressure (mm)	91.25	82.57	0.15

**Fig 1: Comparison of blood pressure of control and study population****RESULTS**

In present study; table 1 shows demographic variables of study population. Males were 62 in number and females were 38. The mean age of study population was 72.56 years and mean BMI was 26.35 kg/m<sup>2</sup>.

Table 2 shows comparison of mean systolic and diastolic blood pressure in study population and controls. It was observed that systolic and diastolic blood pressure were elevated in study population as compared to controls. However, on comparing the results were found to be statistically non-significant. (p>0.05)

## DISCUSSION

In the present study, it was observed that the mean systolic and diastolic blood pressures in urban old population was increased as compared to young population. The results were compared to previous studies in the literature and was observed to be consistent. Singh S et al. assessed the prevalence of hypertension and its associated factors and (2) estimated awareness, treatment, and adequacy of control of hypertension among study subjects. A community based cross-sectional study with multistage sampling design was conducted among urban population of Varanasi. A modified WHO STEPS interview schedule on 640 study subjects aged 25–64 years was used. The prevalence of hypertension was 32.9%. Mean systolic and diastolic BP were  $124.25 \pm 15.05$  mmHg and  $83.45 \pm 9.49$  mmHg, respectively. Higher odds of being hypertensive were found in male subjects, eldest age group, married subjects, subjects of upper socioeconomic status, illiterate subjects, and retired subjects. Tobacco and alcohol consumption, overweight, obesity, and abdominal obesity were also associated with hypertension. Out of the total hypertensive 211 subjects, only 81 (38.4%) were aware about their hypertension status; out of those, 57 (70.4%) were seeking treatment and 20 (35.08%) had their blood pressure adequately controlled. They concluded that around one-third of the subjects were hypertensive and half of the study subjects were prehypertensive in this area. The awareness, treatment, and control of high blood pressure were also very low. Li G et al et al assessed variation in the association between blood pressure (BP) and risk for dementia across a spectrum of older ages and to examine BP changes before dementia onset. A cohort of 2,356 members of a large health maintenance organization aged 65 and older who were initially without dementia. Dementia diagnosis was assessed biennially, and systolic (SBP) and diastolic BP (DBP) were measured at baseline and at four follow-up assessments. Cox proportional hazards models were used to estimate hazard ratios (HRs) for dementia and Alzheimer's disease (AD) associated with baseline BP in different age groups. Within the youngest age group a greater risk for dementia was found in participants with high SBP or borderline-high DBP (80–89 mmHg) than for those with normal BP. The dementia risk associated with SBP declined with increasing age. SBP declined similarly with aging in subjects who developed dementia and those who did not. Thus, in this sample, the association between SBP and dementia risk was not dependent on when BP was measured in relation to onset of dementia. They concluded that high SBP was associated with greater risk of dementia in the young elderly (< 75) but not in older subjects. Adequate control of hypertension in early old age may reduce the risk for dementia.<sup>7,8</sup> Oishi E et al. investigated the association of day-to-day blood pressure variability assessed by home blood pressure measurement with the development of dementia. A total of 1674 community-dwelling Japanese elderly without dementia,  $\geq 60$  years of age, were followed up for 5 years (2007–2012). Home blood pressure was measured 3 times every morning for a median of 28 days. Day-to-day systolic (SBP) and diastolic blood pressure variabilities, calculated as coefficients of variation (CoV) of home SBP and diastolic blood pressure, were categorized into quartiles. The hazard ratios and their 95% confidence intervals of the CoV levels of home blood pressure on the development of all-cause dementia, vascular dementia (VaD), and Alzheimer disease (AD)

were computed with a Cox proportional hazards model. During the follow-up, 194 subjects developed all-cause dementia; of these, 47 had VaD and 134 had AD. The age- and sex-adjusted incidences of all-cause dementia, VaD, and AD increased significantly with increasing CoV levels of home SBP. These associations remained unchanged after adjustment for potential confounding factors, including home SBP. Compared with subjects in the first quartile of CoV levels of home SBP, the risks of the development of all-cause dementia, VaD, and AD were significantly higher in those in the fourth quartile. Similar associations were observed for CoV levels of home diastolic blood pressure. Meanwhile, home SBP levels were significantly associated with the risk of VaD but not with the risks of all-cause dementia and AD. There was no interaction between home SBP levels and CoV levels of home SBP on the risk of each subtype of dementia. They concluded that increased day-to-day blood pressure variability is, independently of average home blood pressure, a significant risk factor for the development of all-cause dementia, VaD, and AD in the general elderly Japanese population. Pratim DP et al assessed the prevalence of hypertension among geriatric population and to find out its association with socio demographic parameters, non-communicable diseases and level of daily activities. 402 persons were selected from total 2258 elderly persons by systematic random sampling and data was collected using pretested questionnaire followed by physical examination. Prevalence of hypertension was significantly more among higher age group. Hypertension was also associated with Diabetes mellitus, cardiovascular diseases, cerebrovascular accidents and obesity. 38.46% hypertensives were not under medication. Practice of taking antihypertensive medicines was significantly lower in lower income group and illiterates. Activities of daily living for self-maintenance and level of satisfaction over life were significantly lower among hypertensives. They concluded that more than half of the elderly are suffering from hypertension. Most of the hypertensives are suffering also from other diseases, resulting in significant reduction of daily activities and compromised satisfaction over life. Hypertension, being a treatable ailment, leaves a space for intervention to reduce these geriatric morbidities.<sup>9,10</sup>

## CONCLUSION

Within the limitations of the current study, this can be concluded that the blood pressure is elevated in old population in the urban areas. This can be attributed to increased stress of the urban life.

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**Source of Support:** Nil.

**Conflict of Interest:** None Declared.

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**Cite this article as:** Garima Singh. Assessment of Variations Occurring in Blood Pressure of Urban Elderly Population: An Institutional Based Study. *Int J Med Res Prof.* 2018 Sept; 4(5): 373-76. DOI:10.21276/ijmrp.2018.4.5.088