



A COMPARATIVE STUDY OF PRE-HYPERTENSION AND HYPERTENSION AND ITS ASSOCIATED RISK FACTORS IN URBAN AND RURAL FIELD PRACTICE AREA OF SKMCH, MUZAFFARPUR, BIHAR

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ABSTRACT

Background: Hypertension (HTN) is endemic in India and it is considered a public health challenge in both economically developed and developing nations. Unfortunately, despite its high prevalence, its awareness, treatment, and control status are low in urban as well as rural Indian populations. **Aims & Objective:** To determine the burden of hypertension and prehypertension in urban and rural field practice area of SKMCH Muzaffarpur and to find the association of hypertension with the age group and sex of study subjects. **Methods And Materials:** A cross-sectional study was carried out among 400 patients of age 25 years and above attending the Out Patient Department (OPD) of the rural health training centre, kanti, Muzaffarpur. JNC 7 classification of blood pressure was used to diagnose hypertension. Demographic and socioeconomic factors, family history of selected medical conditions, and lifestyle factors were obtained for all participants. Systolic blood pressure (BP) and diastolic BP levels were measured for all subjects. **Result:** The prevalence of HT and pre-HT were 42.0% (45.1% in women and 42.6% in men) and 13.6% (11.5% in women and 15.7% in men), respectively. Overall, only 43% of the hypertensive individuals had been previously diagnosed. Furthermore, 53.6% of the hypertensive subjects were being treated with antihypertensive drugs (AHD), but only 22.4% of treated subjects had their BP adequately controlled. Among all hypertensive subjects (known and newly diagnosed), only 6.33% had their BP under control. The prevalence of HT increased with age, being highest in the 60- to 69-year-old age group (82.6%) but lower again in the 70 yrs. age group. **Conclusion:** In our study, more than 42 percent of urban and rural field practice area patients were found to have hypertension and pre-hypertension. Health-seeking behavior was more among females.

KEYWORDS : Hypertension, prehypertension, prevalence and associated risk factors.

INTRODUCTION:

Hypertension (HT) is an important public health problem worldwide and is the most widely recognized modifiable risk factor for cardiovascular disease (CVD), cerebrovascular disease (stroke) and end-stage renal disease [1]. Worldwide prevalence estimates for HT may be as much as 1 billion individuals, and 7.1million deaths per year may be attributable to it [2]. The prevalence of HT varies widely among different populations, with rates as low as 3.4% in rural Indian men and as high as 72.5% in Polish women [1]. Differences in genetic background, environmental factors (especially diet and physical activity) and variations in study protocols all influence the prevalence of HT in adults [3]. In economically developed countries, the prevalence of HT ranged between 20 and 50%. Although HT is well recognized as a major cause of morbidity and mortality in the economically developed world, the importance of HT in economically developing countries is less well established [1]. Recently, the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High BP (JNC-7) defined a new set of guidelines for the prevention and management of HT. According to the JNC-7, normal BP is defined as a systolic BP (SBP) less than 120 mmHg and a diastolic BP (DBP) less than 80 mmHg; an SBP of 120 –139 mmHg or a DBP of 80–90 mmHg is defined as prehypertension (pre-HT) [4]. Pre-HT is not a disease category; however, prehypertensive subjects are known to be at high risk for developing HT, and even slightly elevated BP increases cardiovascular risk [5]. HT is also a common and consistent health problem in developing countries, and its prevalence is currently rising steadily [1].

Current research have shown that hypertension is present in 25% of urban and 10% of rural subjects in India.[6]. In various studies carried out in Delhi the prevalence of hypertension was 17.4% and 14.1% among slums and rural areas respectively, while the prevalence of hypertension was 40% among urban areas of Uttarakhand [7-9].

AIMS AND OBJECTIVE:

To determine the burden of hypertension and prehypertension in urban and rural field practice area of SKMCH Muzaffarpur and to find the association of hypertension with the age group and sex of study subjects.

MATERIAL AND METHODS:

The study was conducted from November 2021 to October 2022 after obtaining the institutional ethical committee clearance. Participants who consented for participation in the study were enrolled as study subjects. Data were collected on a semi-structured proforma having information on demographic data, personal and family history of HTN, smoking, alcohol, dietary habits including fast food intake, salt and fat intake, exercise etc. Body weight, height, and blood pressure (BP) were measured. Anthropometric measurements were performed with the participants wearing light clothing and no footwear. Body weight was measured to the nearest 0.5 kg using a digital weight scale, which was calibrated by using an object with known weight to ensure accuracy. Height was recorded to the nearest 1 cm in the standing position using a portable stadiometer. Body mass index (BMI) was calculated as the weight (kg)/height (m)²

BP measurement and classification SBP and DBP were measured after the subject had rested for 15 min, using a standardized aneroid sphygmomanometer and cuffs of appropriate sizes 23 x 12.5 cm. The subject's arm was placed at heart level in a sitting position. Measurements were taken thrice and the mean was taken for all cases. If readings varied by 10 mmHg, an additional reading was performed. Participants were advised to avoid cigarette smoking, alcohol, caffeinated beverages and exercise for at least 30 min before their BP measurement. The Korotkoff phase I (appearance) and phase V (disappearance) were recorded for the SBP and DBP, respectively. The classification of normotensives, pre-hypertensive and hypertensive was based on the classification of BP from the JNC-7. Normal BP was defined as not being on antihypertensive medication and having an SBP of less than 120 mmHg and DBP of less than 80 mmHg. Pre-HT was defined as not being on antihypertensive medication and having an SBP of 120–139 mmHg or DBP of 80–89 mmHg. HT was defined based on the JNC-7 cut-off point of 140 mmHg and above for SBP and/or 90 mmHg and above for DBP, and also if the subject was on antihypertensive medication. Stage 1 HT was defined as an SBP of 140–159 mmHg or DBP of 90–99 mmHg and Stage 2 HT SBP \geq 160 mmHg or DBP \geq 100 mmHg.

Study Design

Cross sectional study in urban and rural field practice area of SKMCH Muzaffarpur, Bihar.

Samples Of The Study-

The study was carried out among 400 patients of age 25 years and above attending the Out Patient Department (OPD) of the rural health training centre, kanti, Muzaffarpur.

STUDY DURATION: November 2021 to October 2022

Inclusion criteria:

1. Both the genders are selected

Exclusion criteria:

1. Age not less than 25 and more than 60 years.

Statistical Analysis:

The collected data was analyzed using the Statistical Package for Social Sciences (SPSS) version 20.0. Appropriate statistical tests were used.

RESULT:

Prevalence of pre-HT and HT

The clinical and metabolic characteristics of subjects with pre-HT and HT and without pre-HT and HT included in the study. All values were significantly increased in pre-HT and HT groups compared with the normal subjects. The prevalence of HT and pre-HT were 42.0% (45.1% in women and 42.6% in men) and 13.6% (11.5% in women and 15.7% in men), respectively. Overall, only 43% of the hypertensive individuals had been previously diagnosed. Furthermore, 53.6% of the hypertensive subjects were being treated with antihypertensive drugs (AHD), but only 22.4% of treated subjects had their BP adequately controlled. Among all hypertensive subjects (known and newly diagnosed), only 6.33% had their BP under control. The prevalence of HT increased with age, being highest in the 60- to 69-year-old age group (82.6%) but lower again in the 70 yrs. age group. Prevalence of HT was higher in women than that in men (P<0.001). There were some differences in the prevalence of HT in both men and women among urban.

DISCUSSION:

The prevalence of HT was found to be 44%. The combined prevalence of both pre-HT and HT was excessively high (58.5%). According to the logistic regression analysis, age, sex, level of education, BMI and a family history of selected medical conditions were found to be associated with the

prevalence of pre HT and HT. Only 41% of subjects were aware of their HT, 54.5% of them were receiving antihypertensive treatment, and 24.3% receiving antihypertensive agents were under control. Therefore, only 5.43% of all the hypertensive subjects were under control. The prevalence of HT varies widely among different populations and is somewhat dependent on factors such as race, lifestyle and degree of urbanization [10]. These differences may reflect the effects of dynamic interactions among genetic, demographic, sociocultural and economic factors. Moreover, the results may be variable in different regions of a country [11]. In the literature, HT is more prevalent among men than women [12–16] although the prevalence is more among women than men in other studies [17–21]. In the other rare studies, the prevalence of HT was similar among men and women [11–22]. The variation may be explained by differential distribution in risk factors (e.g. genetic predisposition, dietary factors, lack of physical activity) between women and men across populations. The male gender is an independent risk factor for HT and CVD [16]. Age is strongly associated with HT. In many studies, it was reported that the prevalence of HT increased with age [23–24]. In the present study, the prevalence of hypertension and pre-hypertension was significantly higher in obese and overweight subjects; the results showed that as the BMI increases risk of developing pre-hypertension and hypertension also increases in univariate as well as multivariate analysis. Mean BMI was significantly higher among pre-hypertensive and hypertensive subjects as compared to normotensive. There was positive relation observed between increasing BMI and increasing rate of hypertension, which was consistent with other studies [25–27,28, 29].

CONCLUSION:

In our study, more than 42 percent of urban and rural field practice area patients were found to have hypertension and pre-hypertension. Health-seeking behavior was more among females.

REFERENCES:

- 1 Kearney PM, Whelton M, Reynolds K et al. Worldwide prevalence of hypertension: a systematic review. *J Hypertens* 2004;22:11–19.
- 2 World Health Report 2002: Reducing risks, promoting health life. Geneva, Switzerland: World Health Organization, 2002. <http://www.who.int/whr/2002/>
- 3 Altun B, Arici M, Nergizoglu G et al. for the Turkish Society of Hypertension and Renal Diseases. Prevalence, awareness, treatment and control of hypertension in Turkey (the PatenT study) in 2003. *J Hypertens* 2005;23:1817–23.
- 4 Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. The Seventh Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA* 2003;289:2560–72.
- 5 Vasan RS, Larson MG, Leip EP et al. Assessment of frequency of progression to hypertension in non-hypertensive participants in the Framingham Heart Study: a cohort study. *Lancet* 2001;358:1682–6
- 6 Gupta R. Convergence in urban-rural prevalence of hypertension in India. *J human hypertension*. 2016;30(2):79.
- 7 Pamesar S, Chaturvedi S, Saini NK, Avasthi R, Singh A. Prevalence and predictors of hypertension among residents aged 20–59 years of a slumsettlement colony in Delhi, India. *WHO SouthEast Asia J Public Health*. 2013;2:83–7.
- 8 Kishore J, Gupta N, Kohli C, Kumar N. Prevalence of hypertension and determination of its risk factors in rural Delhi. *Int J hypertension*. 2016;2016.
- 9 Jha SK, Vandana S, Rawat CMS, Ahmad S, Kumar S, Kaur A. Prevalence and determinants of prehypertension and hypertension among adults in an urban area in Haldwani city of Nainital: A population based cross-sectional study. *Indian J Prev Soc Med*. 2015;46:42–8.
- 10 Racial/ethnic disparities in prevalence, treatment, and control of hypertension – United States, 1999–2002. *MMWR Morb Mortal Wkly Rep* 2005;54:7–9.
- 11 Onal AE, Erbil S, Ozel S et al. The prevalence of and risk factors for hypertension in adults living in Istanbul. *Blood Press* 2004;13: 31–6
- 12 Joffres MR, Ghadirian P, Fodor JG et al. Awareness, treatment, and control of hypertension in Canada. *Am J Hypertens* 1997;10: 1097–102.
- 13 Velazquez MO, Rosas PM, Lara EA et al. Arterial hypertension in Mexico: results of the National Health Survey 2000. *Arch Cardiol Mex* 2002;72:71–84.
- 14 Shanthirani CS, Pradeepa R, Deepa R et al. Prevalence and risk factors of hypertension in a selected South Indian population—the Chennai Urban Population Study. *J Assoc Physicians India* 2003;51: 20–7.
- 15 Stein AD, Stoyanovsky V, Mincheva V et al. Prevalence, awareness, treatment and control of hypertension in a working Bulgarian population. *Eur J Epidemiol* 2000;16:265–70.
- 16 Jenei Z, Pall D, Katona E et al. The epidemiology of hypertension and its

- associated risk factors in the city of Debrecen, Hungary. *Public Health* 2002;116:138-44.
17. Asmar R, Vol S, Pannier B et al. High blood pressure and associated cardiovascular risk factors in France. *JHypertens* 2001;19: 1727-32.
 18. Choi KM, Park HS, Han JH et al. Prevalence of prehypertension and hypertension in a Korean population: Korean National Health and Nutrition Survey 2001. *JHypertens* 2006;24: 1515-21.
 19. Ahmad K, Jafar TH. Prevalence and determinants of blood pressure screening in Pakistan. *JHypertens* 2005;23:1979-84.
 20. Mendez MA, Cooper R, Wilks R et al. Income, education, and blood pressure in adults in Jamaica, a middle-income developing country. *Int J Epidemiol* 2003;32:400-8.
 21. Jafar TH, Levey AS, Jafary FH et al. Ethnic subgroup differences in hypertension in Pakistan. *JHypertens* 2003;21:905-12.
 22. Lai SW, Li TC, Lin CC et al. Hypertension and its related factors in Taiwanese elderly people. *Yale J Biol Med* 2001;74:89-94
 23. Ahmad K, Jafar TH. Prevalence and determinants of blood pressure screening in Pakistan. *JHypertens* 2005;23:1979-84
 24. Steyn K, Gaziano TA, Bradshaw D et al. South African Demographic and Health Coordinating Team. Hypertension in South African adults: results from the Demographic and Health Survey, 1998. *JHypertens* 2001;19:1717-25.
 25. Panesar S, Chaturvedi S, Saini NK, Avasthi R, Singh A. Prevalence and predictors of hypertension among residents aged 20-59 years of a slumresettlement colony in Delhi, India. *WHO SouthEast Asia J Public Health*. 2013;2:83-7.
 26. Kishore J, Gupta N, Kohli C, Kumar N. Prevalence of hypertension and determination of its risk factors in rural Delhi. *Int J hypertension*. 2016;2016.
 27. Jha SK, Vandana S, Rawat CMS, Ahmad S, Kumar S, Kaur A. Prevalence and determinants of prehypertension and hypertension among adults in an urban area in Haldwani city of Nainital: A population based cross-sectional study. *Indian J Prev Soc Med*. 2015;46:42-8
 28. Abebe SM, Berhane Y, Worku A, Getachew A. Prevalence and associated factors of hypertension: a cross-sectional community based study in Northwest Ethiopia. *PLoS One*. 2015;10(4).
 29. Mishra CP, Kumar S. Risk factors of hypertension in a rural area of Varanasi. *Indian J Prev Social Med*. 2011;42(1):101-11.