

# PREVALENCE, AWARENESS, TREATMENT AND CONTROL OF HYPERTENSION AMONG THE PEOPLE ABOVE 15 YEARS IN RURAL AREA NAGPUR MAHARASHTRA - A CROSS SECTIONAL STUDY

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## ABSTRACT

**Introduction:** High blood pressure (BP) is a major risk factor for cardiovascular disease and better control can lead to prevention of 300,000 of the 1.5 million annual deaths from cardiovascular diseases in India.

**Objective:** - To evaluate the prevalence, awareness, treatment and control of hypertension among rural population of Maharashtra.

**Method:-**The study involved a survey of 1964 male and 1807 female respondents, aged 15 years and above. Multistage sampling was used for recruitment (PHCs/ sub-centres/ villages). All households in the selected villages were covered and all subjects above 15 years in the household were interviewed. JNC VII criteria was used for labelling a person as hypertensive.

**Findings:** - The overall prevalence of hypertension (JNC VII criteria) was 15.4 % (95% CI 13.2% - 16.4%) among men and 15.9 % (95% CI 14.1 % - 17.6%) among women. Among study subjects who had hypertension, 14.5% were aware of their condition, 9.4 % were taking anti-hypertensive medications, but only 3.9 % achieved the level established by the (JNC VII)/WHO criteria.

**Conclusions:** - We observed that overall prevalence of HTN was higher in this part of rural area. Nearly half of the population was in the pre HTN. We noted a striking lack of awareness of the condition among and a suboptimal rate of control among those treated. These findings emphasize the public health importance of hypertension in the rural population and the likely increase in magnitude of this problem in India in the near future.

**Keywords:** Awareness, Control, Hypertension, India, Prevalence, Treatment

## INTRODUCTION

Hypertension (HTN) is an internationally common disease and an important treatable public health problem. It is defined as a blood pressure (systolic / diastolic) 140 / 90 mmHg.<sup>1</sup> It is a major risk factor and a powerful predictor of cardio-vascular morbidity and mortality with proven benefits after treatment. Improved control of hypertension, in turn, has contributed to reductions in incidence rates for stroke and ischemic heart disease.<sup>2,3</sup> Despite these gains poorly controlled hypertension remains a major health problem. Data in literature suggests that

79% of people with hypertension do not have their blood pressure under control.<sup>4</sup>

It is the third leading killer in the world and is responsible for one in every eighth death.<sup>5</sup> It is a silent killer and most of the patients are accidentally detected to have HTN, when they are admitted to the hospital for unrelated disease or are subjected to pre operative check up and then their blood pressure (BP) is examined. Many patients are diagnosed when they seek medical advice due to target organ damage. Hence, it is important to know the BP status before target organ damage occurs and to keep the BP under control, once HTN is

detected. It is estimated that more than 60 million Indian may have HTN.<sup>5</sup>

In India, the prevalence of HTN varies considerably from one region to another. So a cross sectional study was conducted to find out the prevalence of HTN, its awareness and control in rural population of Nagpur, Maharashtra.

## MATERIAL AND METHODS

We conducted a cross-sectional community based study in the rural area of Saoner, Nagpur district of Maharashtra from May 2009 to November 2009. To calculate the sample size, one of the previous studies demonstrated the prevalence of hypertension to be 33% in rural area of Dibrugarh, Assam<sup>6</sup> and to provide a 95% confidence interval with 5% margin of error; we estimated a sample size of nearly 3600 people above 15 years of age. We included younger age group, as this age group is not routinely studied and screened for hypertension so we tried to get the insight into this age group as well. Multistage sampling was used for the purpose of recruitment. Tehsil Saoner of Nagpur district has 5 Primary Health Centres (PHCs), out of which PHC Khapa was randomly selected; PHC Khapa has 5 sub-centres covering 30,030 populations of total 20 villages as per PHC record. Out of these sub centre Wakodi and Kodegaon was randomly selected. One village was randomly selected from the list of villages in the sub-centre. If the village was small, an additional village was selected from the same sub-centre. We developed a multi-item structured questionnaire to elicit the following information from the study participants: demographic characteristics (e.g., age, marital status, religion, education and monthly expenditure of both the participant and his/her family members); medical history of the participant (self-reported health conditions such as hypertension or diabetes mellitus, medications used, and history of visits to physicians over the year immediately preceding the survey). Ethical clearance from our Institutional Ethical Committee was obtained. The objective of the study and the method was explained to the Sarpanch of respective village and his cooperation was sought. All the households in the selected villages were covered and all subjects above 15 years in the household were interviewed. House to house survey was carried out in morning as well as evening hours

to get maximum number of study subjects at home.

Hypertension was defined as BP  $\geq 140/\geq 90$  or currently on antihypertensive drugs. Person having systolic BP between 120-139 and / or diastolic BP between 80-89 was labelled to have pre-hypertension. Stage1 hypertension was taken as systolic BP between 140-159 and/ or diastolic BP between 90-99 mmHg. Stage 2 hypertension was taken as systolic BP  $> 160$  and/ or diastolic BP  $> 100$  mmHg.<sup>7</sup> Awareness of hypertension was based on the subjects' report of a prior diagnosis of hypertension (or high blood pressure) made by a health professional. Current use of prescription medication for lowering elevated blood pressure among hypertensive subjects in our sample was considered as treatment of hypertension; we considered only pharmacological treatment, including allopathic or any alternative medicine medications. In order to avoid misclassification of non-hypertensive individuals taking cardiovascular medications for indications other than hypertension, a diagnosis of treated hypertension was made only if the subject reported a prior diagnosis of hypertension and was using antihypertensive agents. We defined control of hypertension as pharmacological treatment associated with an SBP  $< 140$  mmHg and a DBP  $< 90$  mmHg.<sup>8</sup>

The blood pressure was measured using OMRON digital automatic blood pressure monitor. Team had three members including one female; they were trained to record BP and were regularly supervised by the investigator. The result of the measurement was provided to the respondents and all case needing referral were referred to the Government Medical College, Nagpur to consult a physician.

Data were entered simultaneously. 10 percent data was re-entered and these were validated. For analysis, data was stratified into age groups of 10 years class interval, analysis was performed using statistical programme (SPSS Version 15.0, SPSS Inc, Chicago, USA).

## RESULTS

Total 3771 people above 15 years were examined in three villages, which turned out to be about 70.8% of the total population of these villages. 1964 were male and 1807 were females. The mean age of the male and female study subjects was found to be  $37.04 \pm 16.28$  years and  $38.07$

±16.57 years respectively. These villages had mostly hindu population, 71.5%. Literacy status was 66.7% and majority of the study participants (41.2%) belonged to lower socio-economic status.

**Table 1: Prevalence of hypertension among study population**

Age (yrs)	Males			Females			Total		
	No.	HTN	%	No.	HTN	%	No.	HTN	%
15-24	586	6	1	526	4	0.8	1112	10	0.9
25-34	450	44	9.8	471	37	7.9	921	81	8.8
35-44	377	68	18	318	56	17.6	695	124	17.8
45-54	233	61	26	179	55	30.7	412	116	28.2
55-64	185	63	34	181	84	46.4	366	147	40.2
65-74	115	39	34	115	41	35.7	230	80	34.8
>=75	18	10	56	17	11	64.7	35	21	60
Total	1964	291	15	1807	288	15.9	3771	579	15.4

**Table 2: Study subjects according to grade of hypertension (JNC VII criteria)**

Age (Yrs)	Total No. (%)	Normal B.P. No. (%)	Pri-Hypertensive No. (%)	Hypertensive		
				All No. (%)	Stage 1 No. (%)	Stage 2 No. (%)
15-24	1112 (29.5)	576 (51.8)	526 (47.3)	10 (0.9)	9 (90.0)	1 (10.0)
25-34	921 (24.4)	337 (36.6)	503 (54.6)	81 (8.8)	65 (80.2)	16 (19.8)
35-44	695 (18.4)	278 (40.0)	293 (42.2)	124 (17.8)	91 (73.4)	33 (26.6)
45-54	412 (10.9)	126 (30.6)	170 (41.3)	116 (28.2)	77 (66.4)	39 (33.6)
55-64	366 (9.7)	87 (23.8)	132 (36.1)	147 (40.2)	83 (56.5)	64 (43.5)
65-74	230 (6.1)	92 (40.0)	58 (25.2)	80 (34.8)	38 (47.5)	42 (52.5)
>=75	35 (0.9)	9 (25.7)	5 (14.3)	21 (60.0)	6 (28.6)	15 (71.4)
Total	3771 (100)	1505 (39.9)	1687 (44.7)	579 (15.4)	369 (63.7)	210 (36.3)

In the present study, overall prevalence of hypertension among total study subjects was 579(15.4%) 95% CI 14.1 % - 17.6%. In males it was 291(14.8%) 95% CI 13.2% - 16.4% while in females it was 288(15.9%) 95% CI 14.1 % - 17.6%. Table 1 shows the age wise distribution of the examined and hypertensive patients. Only 39.9% of the study subject had B.P. under

normal range. Almost half of the study subjects 1687 (44.7%) were pre-hypertensive and among males and females it was 864 (44.0%) and 823 (945.5%) respectively. Total 210 (5.6%) study subjects were in Stage 2 hypertension while in males it was 93 (4.7%) and in females it was 117 (6.4%). (Table 2)

**Table 3:- Awareness, treatment, and adequacy of control of hypertension in study sample**

Group	All hypertensive			Treated Cases/ total
	Aware (%)	Treated (%)	Controlled (%)	Controlled (%)
Total Hypertensive (n=579)	84 (14.5)	55 (9.4)	23 (3.9)	23/55 (41.8)
Men Hypertensive (n=291)	38 (13.1)	22 (7.5)	7 (2.4)	7/22 (31.9)
Women Hypertensive (n=288)	46 (16.0)	33 (11.4)	16 (5.5)	16/33 (48.5)

(Table 3) Only 84 of 579 hypertensive subjects were aware of their elevated blood pressure (14.5%). Out 579 hypertensive subjects 55(9.4%) were taking pharmacological treatment for the condition, mostly allopathic. However, only 23 of these 55 (41.8%) had their BP under control. Fig.1 shows the level of awareness and treatment among the hypertensive patients. So,

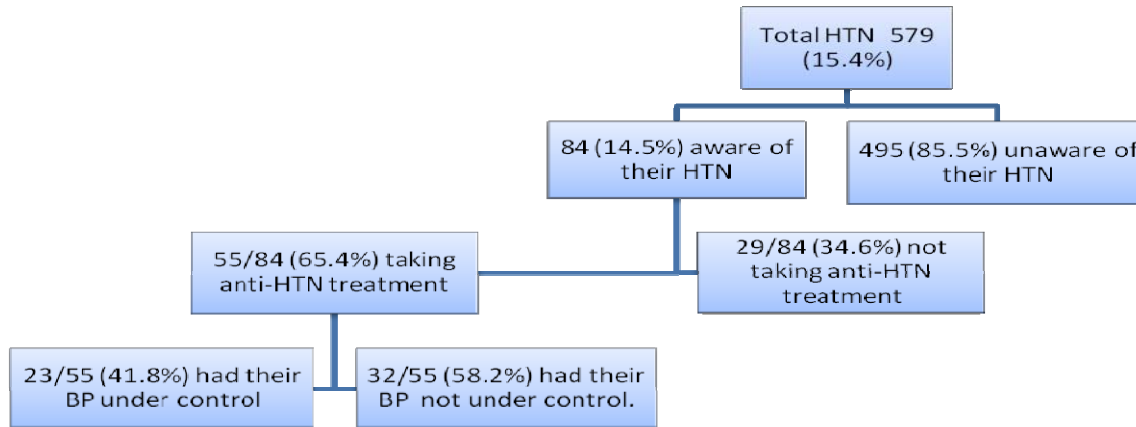
out of total 579 hypertensive patient only 23 i.e. 3.9% had their B.P. under control.

## DISCUSSION

Our findings provide direct evidence of an increasing burden of hypertension among the rural population, especially among the elderly people. HTN is a major health problem in India

and other developing countries. The various studies have shown the prevalence of HTN among urban population ranging from 1.24% in 1949 to 36.4% in 2003 and for rural people from 1, 99% in 1958 to 21.4% in 1994.<sup>9</sup> However the different rates are due to different cut off marks in determining the level of HTN and also

different age groups, constituting the study population. Urban studies done recently have shown an increasing overall prevalence of HTN from 6.64% in 1988 to 36.4% in 2003, considering a cut off mark of 140/90.<sup>10-11</sup> Gupta et al in more recent studies have shown a prevalence of 21.1% in rural India and 32% in urban India.<sup>12</sup>



**Fig 1: Awareness and treatment level in hypertensive patients**

Our study shows that around half of the population was in pre HTN group (44.7%). The prevalence of pre HTN was more in younger population. Das et al also showed an inverse relationship between the prevalence of pre HTN and age<sup>13</sup> and particular victims were students and labourer. These participants are of great interest, since chances of progression to HT is high. Studies have already established that relationship between BP and risk of cardiovascular disease events is continuous, consistent and independent of other risk factors and pre hypertensive have a greater chance to go in to HTN.

The overall awareness, treatment and adequacy of control of hypertension in our sample were low (14.5%, 9.4 % and 3.9%, respectively). Although these proportions are lower than those reported from some developed countries<sup>8</sup>, they are quite similar to those reported from other developing countries.<sup>14</sup> Competing health priorities (such as the co-existing burden of communicable diseases) and scarce health resources affect the availability, accessibility and affordability of physician services in both the public and private sectors in developing countries. Furthermore, health perceptions (such as the belief that health changes are a natural consequence of aging, constructs of acute versus chronic illness), socioeconomic factors (increased dependence, burden of drug costs), reduced physical mobility, attitudes towards pill

taking, and a low level of overall education, in general, and health education, in particular, impact the health-seeking behaviour of the elderly. A combination of these factors possibly contributes to the low level of awareness, treatment and control of hypertension in our study sample. The better awareness and treatment of hypertension among women has been consistently documented<sup>15</sup> but the reasons are not entirely clear. Differences in health seeking behaviour, and a greater opportunity for casual blood pressure screening due to more frequent contacts with the health care system may contribute to this gender-related difference.

The study's modest sample size, adequate representation of women and the very old, standardized methods, use of a door-to-door survey and of health professionals for blood pressure measurement are strengths of our investigation. Nonetheless, certain limitations of our approach need to be acknowledged. The use of a single visit to ascertain hypertension status can result in an overestimation of its prevalence.

## CONCLUSION

In our population-based study, we observed that overall prevalence was higher in this part of rural area. Nearly half of the population was in the pre HTN. We noted a striking lack of awareness of the condition among and a

suboptimal rate of control among those treated. These findings emphasize the public health importance of hypertension in the rural population and the likely increase in magnitude of this problem in India in the near future.

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