

## Research Article

# Prevalence, awareness, treatment and control of hypertension among adults of Raipur city, Chhattisgarh, India: a cross sectional study

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## ABSTRACT

**Background:** Hypertension is prevalent all over the world. Usually it is readily detectable, easily treatable condition and if left untreated may leads to serious complications. In considerable proportion of cases the disease tends to be asymptomatic for prolonged time, hence also labelled as 'Silent killer'. 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. The objective of the study was to find the prevalence, awareness, treatment and control status of hypertension among adults of Raipur city.

**Methods:** A community based cross sectional study was carried out in 768 subjects of age 25-59 years residing in Raipur city, Chhattisgarh, India. A predesigned, pretested questionnaire was used for data collection. To classify blood pressure JNC VII criteria was used.

**Results:** The prevalence of hypertension was 29.0 %. Out of 223 hypertensive (223/768), 59.2% were aware about their hypertensive status, in them 76.9% were on treatment and 49.5% were under control.

**Conclusions:** There was striking lack of awareness of the condition and a suboptimal rate of control among those treated. These finding emphasize public health importance of hypertension in Raipur city and there is urgent need to address this through targeted intervention.

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

## INTRODUCTION

Hypertension is the new era pandemic which is the leading cause of mortality in the world and is ranked third as a cause of disability-adjusted life years.<sup>1</sup> Subjects with hypertension possess two fold higher risk of developing coronary artery disease (CAD), four times higher risk of congestive heart failure and seven times higher risk of cerebrovascular diseases compared to normotensive subjects.<sup>2,3</sup>

The 'Global Burden of Disease study' has projected Coronary Artery Diseases & Cerebrovascular diseases as the leading cause of death worldwide by the year 2020.<sup>4</sup> Globally cardiovascular disease accounts for

approximately 17 million deaths in a year, nearly one third of the total.<sup>5</sup> Of these, complications of hypertension accounts for 9.4 million deaths worldwide every year.<sup>6</sup>

Hypertension is responsible for at least 45% of deaths due to heart disease, and 51% of deaths due to stroke.<sup>5</sup> Prevalence of hypertension is increasing in many countries in the South East Asia region. In India, raised blood pressure increased from 5% in the 1960s to nearly 12% in 1990s, to more than 30% in 2008.<sup>7</sup>

Ageing population, rapid urbanization and transition from agrarian life to a wage-earning, modern city life are reported as major contributors to increased blood

pressure in urban areas. Chhattisgarh state is no exception to this. Hence this community based cross – sectional study on prevalence of hypertension and its awareness, treatment and control was taken up.

## METHODS

We conducted community based cross – sectional study in Raipur city (C.G.) from August 2014 to July 2015. To calculate sample size prevalence of India 35% was taken as demonstrated by WHO.<sup>1</sup> Sample size was calculated by using statistical formula, used:  $n = Z^2 P (1 - P) / d^2$ , where n = sample size, Z = Z statistic for a level of confidence, P = expected prevalence or proportion (35%, P = 0.35), and d = precision (in proportion of one; if 3.5%, d = 0.035).

A total of 713 figures came using statistical formula. In order to give equal representation to all the selected area it was decided to select 24 subjects from each of 32 areas. 24 subjects (713/32) from each of 32 areas were selected that came out to be 768. Therefore a total 768 subject were included in study.

Multi stage random sampling technique was used for recruitment. Raipur city is divided in to total 8 zones, 70 wards. From 8 zones, four zones were selected by lottery method. From each zone four wards were randomly selected. In order to make population representative both slum and non - slum area were included in the study.

For this, from each ward one identified slum area and one non-slum area were selected, included in the study. A total of 32 areas were included in this study.

### ***Inclusion criteria***

All adults of age group 25-59 years and who were residing in the study area for at least one year, and willing to participate.

### ***Exclusion criteria***

Those who were not willing to participate in study and severely ill.

All the subjects were personally contacted in their houses, examined and interviewed using the pre-tested proforma. On visiting the family, baseline data of the family members was taken and persons aged 25 to 59 years were screened by taking two BP readings at an interval of 5 minutes.

Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured. Average of the two readings was considered. Those found to have hypertension were examined in detail and further history was recorded.

Hypertension was defined as systolic blood pressure

more than or equal to 140 mmHg or diastolic blood pressure more than or equal to 90 mmHg based (JNC VII).<sup>8</sup> All subjects currently on anti-hypertension medication or having a prescription of antihypertensive drugs were classified as hypertensive irrespective of their current blood pressure reading.

A subject was said to be “aware” of hypertension status if he/she reported a prior diagnosis of hypertension (or elevated BP) made by a healthcare provider. Treatment of hypertension was defined as either having current prescription of medication for lowering the elevated BP or having antihypertensive medication shown at the time of survey (only pharmacologic treatment used at the time of the survey was considered).

Control of hypertension was defined as anti-hypertensive treatment associated with SBP and DBP less than 140 mmHg and 90mmHg respectively.<sup>9</sup>

The information thus collected was compiled, processed and analyzed in MS Excel software. Descriptive statistical analysis has been carried out in the present study. Results on categorical measurements are presented in numbers (%). Chi-square test been used to find the significance of study parameters on categorical scale between two or more groups. P-value of <0.05 was considered to be statistically significant.

## RESULTS

Total 768 subjects of age group 25-59 years were examined (Table 1) 443 were female and 325 were males. The mean age of male and female study subjects were found to be  $40.09 \pm 10.03$  and  $39.67 \pm 10.16$  years respectively. The studied areas had mostly Hindu population (87.6%). Literacy status was 84.1% and majority of the study participants (37.8 %) belonged to Class IV socio- economic status (Modified Kuppuswami classification).

In the present study, overall prevalence of hypertension among total study subjects was 223 (29.0%) (Table 2). In males it was 325 (42.3%), while in females it was 443 (57.7%).

Table 2 shows the age wise distribution of study subjects. Only 26.4% of the study subject had B.P. under normal range. Almost half of the study subjects (44.5%) were prehypertensive. Among the hypertensive subjects 15.8 % were on antihypertensive medication.

Among the hypertensives more than half (59.2%) were aware about their hypertension, and 40.8% were unaware. Among the hypertensive subjects 54.3% were on treatment and 45.7% were not taking treatment. Among aware hypertensives 91.7% were taking treatment and 8.3% were not taking treatment, hypertensive which were on treatment more than two third of subjects were on regular treatment, of which 23.1% hypertensive subjects

were on irregular treatment. About control status nearly half of hypertensive subjects were in control (Table 3)." with "Among the hypertensives more than half (59.2%)

were aware about their hypertension, out of which 70.5% were on treatment and out of treated hypertensives only half (49.5%) were under control (Table 3).

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

Age (years)	Male			Female			Total
	Hypertensive	Normotensive	Total	Hypertensive	Normotensive	Total	
25 – 29	4 (3.7)	51(21.4)	55 (39.9)	0 (00)	83 (25.4)	83 (60.1)	138 (18)
30 – 34	6 (5.6)	48 (20.2)	54 (16.6)	11 (9.5)	68 (20.8)	79 (17.8)	133 (17.3)
35 – 39	16 (14.9)	35 (14.7)	51 (15.7)	7 (6.0)	50 (15.3)	57 (12.9)	108 (14.1)
40 – 44	23 (20.2)	30 (26.3)	53 (46.5)	15 (13.2)	46 (40.2)	61 (53.5)	114 (14.8)
45 – 49	17 (15.9)	16 (6.7)	33 (10.2)	32 (27.6)	32 (9.8)	64 (14.4)	97 (12.6)
50 – 54	20 (23.8)	15 (17.9)	35 (41.7)	25 (29.8)	24 (28.6)	49 (58.3)	84 (10.9)
55 – <60	21 (22.3)	23 (24.5)	44 (46.8)	26 (27.7)	24 (25.5)	50 (53.2)	94 (12.2)
p=0.0000							

**Table 2: Distribution of study subjects according to grade of hypertension.**

Age (yrs)	Normal	Pre hypertension	Stage I	Stage II	On antihypertensive treatment	Total
25 – 29	73 (52.9)	61 (44.2)	00 (00)	2 (1.4)	2 (1.4)	138 (18)
30 – 34	41 (30.8)	75 (56.4)	4 (3)	6 (4.5)	7 (5.2)	133 (17.3)
35 – 39	31 (28.7)	54 (50)	8 (7.4)	8 (7.4)	7 (6.5)	108 (14.1)
40 – 44	28 (24.6)	48 (42.1)	14 (12.3)	9 (7.9)	15 (13.2)	114 (14.8)
45 – 49	18 (18.6)	30 (30.9)	11 (11.3)	12 (12.4)	26 (26.8)	97 (12.6)
50 – 54	5 (6)	34 (40.5)	12 (14.3)	5 (6)	28 (33.3)	84 (10.9)
55 – < 60	7 (7.4)	40 (42.6)	8 (8.5)	3 (3.2)	36 (38.3)	94 (12.2)
Total	203 (26.4)	342 (44.5)	57 (7.4)	45(5.9)	121 (15.8)	768 (100)
p=0.0000						

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

Groups	Aware (%)	Treatment (%)	Control (%)
Total hypertensive (n = 223)	132/223 (59.2)	93/132 (70.5)	46/93 (49.5)
Total male hypertensive (n = 107)	55/107 (51.4)	38/55 (69.0)	20/38 (52.6)
Total female hypertensive (n = 116)	77/116 (66.4)	55/77 (71.4)	26/55 (47.3)

## DISCUSSION

Our findings provide direct evidence of an increasing burden of hypertension among the study population. Different studies regarding prevalence of hypertension among urban Indian population showed that there has been significant increased prevalence of hypertension changing from 4.4% in Agra, 13.1% in Chandigarh and as high as 47% among urban people in Kerala.<sup>10-12</sup>

Prabakaran J et al, they found prevalence of hypertension in their study was 29.3 % which is almost comparable with our study.<sup>13</sup>

The overall awareness, treatment and adequacy of control of hypertension in our sample were low (59.2%, 76.9 %, and 49.5 % respectively). Our finding was similar to study by Desai Rujul et al, found 21.6% of those with hypertension were aware of their disease and most of them were on treatment. However, in only 18.1% of them was the blood pressure adequately controlled (SBP <140 mmHg and DBP <90 mmHg).<sup>14</sup>

Study by Haresh Chandwani et al, revealed that 54 (83.1%) of the subjects were aware of their hypertension, that all those who were aware were being treated, and among those being treated, only 31 (57.4%) had satisfactory control of their hypertension.<sup>15</sup> Steven J.M. van de Vijver et al, observed awareness in the study area is very low, less than 10% of all hypertensive people were receiving treatment, only 2.3% of all hypertensives were controlled.<sup>16</sup> scarcity of resources and more priority to other health related problems affects the availability and accessibility of physicians services in health sectors.

Study's modest sample size, adequate representation of population, use of door to door survey is the strength of the study.

## CONCLUSION

The prevalence of hypertension is high in both males and females. Nearly half of the population was pre hypertensive. There was striking lack of awareness of the condition and a suboptimal rate of control among those treated. These findings emphasize hypertension as public health concern and a comprehensive programme and concerted effort needs to be put into place if improvement is to be achieved.

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