Original Article

Prevalence and predictors of hypertension: Evidence from a study of rural India

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Abstract

Background: Raised blood pressure (BP) is the leading global risk factor for cardiovascular diseases and a major cause of premature death. Worldwide, one in four men and one in five women are hypertensive. For effective preventive strategy, understanding of predictors of hypertension is necessary. **Objective:** To assess prevalence and predictors of hypertension in the rural adult Indian population. **Material and Methods:** This cross-sectional study was carried out on 425 rural subjects (25–64 years) of the Varanasi district in India selected through multistage sampling. Blood pressure of each subject was measured using a standard technique. Sociodemographic data and predictors of hypertension were assessed by interviewing subjects with help of a predesigned and pretested proforma. **Results:** Prevalence of hypertension was 31.5% (95% CI: 27.1–35.9). There existed a significant ($P < 0.05$) association of BP with age, educational status, occupation, socioeconomic class, tobacco consumption, waist circumference, waist-hip ratio, and nutritional status. No significant association was found with gender, religion, caste, marital status, type and size of family, family without NCDs, awareness of screening camps for NCDs and national program for prevention and control of cancer, diabetes, cardiovascular diseases and stroke, and alcohol consumption. Significant association of education, nutritional, and occupational status obtained in univariate analysis got eliminated in the logistic model. Risk of hypertension was higher in the 45–64 years age group (AOR: 3.06; 95% CI: 1.75–5.35) and in socioeconomic class IV and V (AOR: 2.24; 95% CI: 1.17–4.31). **Conclusion:** Prevalence of hypertension in the rural population was high and most of the observed predictors were modifiable.

Keywords: BMI, cardiovascular diseases and stroke, diabetes, hypertension, national program for prevention and control of cancer, noncommunicable diseases, waist circumference, waist-hip ratio

Introduction

Globally, more than 41 million people die annually from noncommunicable diseases (NCDs) (71% of total global deaths), including among 15 million individuals who dies between ages 30-70 years, many have premature death.[1] In India, risk of premature death due to NCDs is 23%, and is slightly more in males (27%) compared to females (20%).[2] Elevated blood pressure (BP) or hypertension is the leading global modifiable risk factor for cardiovascular diseases and is a major cause of premature death. It has modifiable risk factors such as tobacco use, unhealthy diet, physical inactivity, and high alcohol consumption; moreover, an unbreakable bond also prevails between obesity (general as well as central) and hypertension. Nonmodifiable risk factors are family history of hypertension, age above 65 years, and coexisting comorbid conditions.[3] In 2015, one in four men and one in five women had hypertension.[4] According to the WHO NCD country profile (2018), the prevalence of raised blood pressure among Indian adults aged 18+ was 24%. It was almost the same in both the sexes, with 24% men and 23% women having hypertension.[5]

There is a continuous relationship between the level of blood pressure and the risk of complications. With each increment of 20/10 mm Hg in the blood pressure range, CVD risk doubles

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with starting blood pressure of 115/75 mm Hg.[6] In 2019, ischemic heart disease and stroke (sequelae of hypertension) were the top-ranked causes of DALYs in 50 years and older age groups. Of all death globally, 19.2% was attributed to high systolic blood pressure.[4] Currently, the world is facing a syndemic of coronavirus infection along with NCDs, and one of the worldwide focuses for NCDs is the target to decrease the prevalence of hypertension by 25% by 2025 (baseline: 2010).[7,8]

Hypertension is easily diagnosable and controllable with effective medicines. Unfavorable health outcomes associated with hypertension could be lessened through strategies that include early identification, treatment, and control by providing timely access to primary healthcare providers to expedite the process to alleviate the expense of medications for those in treatment through insurance coverage, cost-sharing, and benefit designs, and finally to support hypertension control by expanding worksite wellbeing and quality control measures.[9]

Low healthcare literacy, poor patient self-care, high self-medication rate, inconsistent hypertension management guidelines, and nonadherence to treatment plans and medical regimens leads to poor blood pressure control and high healthcare costs, thus intensifying the problem in India.[10] In fact, the role of primary healthcare physicians is pivotal in the prevention and management of hypertension. Furthermore, this is a cost-effective and scalable approach in tackling the problem of hypertension.

To curb the rising trend of hypertension and to establish new policy implications, one must be first aware of the prevalence and predictors of hypertension. With this background, the present study was undertaken on a representative adult population of rural Varanasi in India, with the objectives to assess prevalence, associates, and predictors of hypertension.

Material and Methods

Study design and study setting

This community-based snapshot study was undertaken in one (viz. Chiraigaon) of the eight community development blocks of Varanasi district, India. The region lies in the eastern part of the Uttar Pradesh territory of North India. As per census 2011, the population of Varanasi district and Chiraigaon Community Development block were 3,676,841 and 2,62,324, respectively. Sex ratio for the district and block was 913 and 899, respectively. Overall literacy rate was 67.1%, whereas for males and females, this was 76.1% and 57.1%, respectively.[11,12]

Participants of the study

This study was conducted on an adequate and representative sample of the rural adult population belonging to the age group 25–64 years. Prevalence of hypertension was taken to be 21% in the rural adult population.[13] Considering the permissible level of error of 5% (absolute), the required sample size worked out to be 254.9, which after adjusting for design effect of 1.5 became 382.4. Furthermore, giving due allowance to nonresponse of 10% the final sample size was fixed at 425.

The following stages were adopted for the selection of study subjects: In the first stage, the Chiraigaon community development block was selected by simple random sampling from eight community development blocks of the Varanasi district. Villages were selected in the next stage by stratified sampling; stratification was done based on distance from block headquarter and from the first stratum of villages within 5 km; one village, that is, *Narayanpur* was selected by simple random sampling. Applying the identical approach, one village, that is, *Umraha* was selected from the second stratum (5–10 km), and the last village, *Chittauna*, was selected from the third stratum (>10 km). Required numbers of families from each village were computed adopting probability proportion to size (PPS) and the estimated families from a particular village were selected by systemic random sampling. One adult (25–64 years) from the selected family was picked up by lottery method.

Inclusion and exclusion criteria

Adults of the age group of 25–64 years consenting for the study were considered as subjects of the study. Pregnant women, subjects with serious mental abnormality or terminal illness, and individuals having duration of stay in the study area less than 6 months were excluded from the study.

Tools and techniques

- *Sociodemographic information:* Information pertaining to age, sex, religion, caste, literacy, marital status, occupation, total family income, family size, socioeconomic status, and family history of diseases and comorbid conditions were obtained by interviewing individuals using predesigned and pretested proforma.[14]
- *Assessment of prevalence of hypertension in study subjects and its predictors:* Hypertension was defined according to the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (Seventh report). A fully automatic, digital blood pressure measuring device (Dr. Morepen BP One; model no: BP-16) was used twice over the right arm of the selected subjects with the interval of 5 minutes to get the average of the two blood pressure readings.[15] Information regarding predictors of hypertension in an individual was obtained by anthropometric measurements. All the anthropometric measurements were done by following a standardized technique. Anthropometric measurements such as weight (accuracy of 0.1 kg) were measured by a Libra weighing machine, height (accuracy of 0.1 cm) was assessed by steel anthropometry rod with parallel bars, waist circumferences (in cm) was taken at the end of expiration by a nonstretchable measuring tape in the smallest point between the costal margins and the iliac crest and lastly hip circumferences (in cm) were measured by wrapping nonstretchable measuring tape over the hips at the widest part.[16] Based on the body mass index (BMI) obtained, Asian classification was used for classifying subjects into different categories.[17] Waist-to-hip circumference (WHR)

was determined by taking the ratio of waist circumference to hip circumference.[18] Particulars regarding tobacco use as well as alcohol consumption were also noted by the interview schedule developed by modifying and pretesting the WHO chronic disease risk factor surveillance STEPS tool.[19]

Ethical approval

Ethical approval was obtained from Institutional Ethical Committee. Hindi consent form was used for obtaining consent from the individual participants.

Statistical analysis

Data thus generated were analyzed using IBM-SPSS version 23.0. Confidence Intervals (95%) were computed for inferential purpose. Associates and predictors (adjusted odds ratios) of hypertension among individuals were obtained through univariate and logistic regression analysis.

Results

Out of 425 subjects, 52.9% and 47.1% subjects were male and female, respectively. Overall sex ratio in the study group was 1000:889. As many as 39.3%, 29.2%, 21.6%, and 9.9% of subjects were from the age group of 25–34, 35–44, 45–54, and 55–64 years, respectively. As many as 84.9% and 15.1% of subjects were from the Hindu and Muslim religions, respectively. In all 24.7%, 52.7%, and 22.6% subjects were from SC/ST, OBC, and other caste categories, respectively. Overall, 82.6% of subjects were married. Twenty-six (6.1%) subjects were without spouses whereas 11 (2.6%) subjects were either separated or deserted. In the case of 201 (47.3%) subjects, highest education in the family was intermediate and above. As many as 52.2%, 41.2%, and 6.6% of subjects were from nuclear, joint, and three-generation families, respectively. There were 6 (1.41%) subjects where higher education in the family was as illiterate, just literate, and literate. In the case of 68.8% of subjects, family size was 4–6, whereas 26.6% of subjects had a family size of >6.

As many as 8.9%, 14.8%, and 2.6% of subjects were illiterate, just-illiterate, and literate, respectively; whereas subjects with educational status as primary, middle, and high school were 21.3%, 19.5%, and 16.5%, respectively. In the case of 11.8% and 4.7% of subjects, educational status was intermediate and graduate and above, respectively. Out of all illiterates, 34.2% and 65.8% were male and female. Out of all males, 5.8% were illiterate. Out of all females, 12.5% were illiterate. In the case of 25.3% and 6.5% female subjects had educational level was intermediate and above. Subjects engaged in agriculture, labor, and business were 17.2%, 25.2%, and 10.6%, respectively. Out of 200 female subjects, 148 (74.0%) were homemakers. In all, 2.1% of subjects were students and 4.9% were unemployed. As many as 4.5%, 16.9%, 64.0% of subjects were from social class II, social class III, and social IV, respectively. Sixty-two (14.6%) subjects were in class V as per Modified B.G. Prasad classification, 2019 [Table 1].

Family history of hypertension and diabetes was present in 26.4% and 23.8% of subjects, respectively. Family history of chronic respiratory diseases (CRDs), cancer, and heart attack were present in 3.8%, 4.0%, and 2.8% of subjects, respectively. Self-reported hypertension was present in 12.0% of subjects [Figure 1].

In the case of 27.1% male and 25.0% female subjects, diastolic blood pressure was >90 mm Hg; overall, this value was 26.1% (95% CI: 21.9–30.5). In all, 20.9% (95% CI: 17.1–24.8) of subjects had systolic blood pressure ≥140 mm Hg [Table 2]. As much as 31.5% (95% CI: 27.1–35.9) were categorized as hypertensive when criteria of diastolic blood pressure >90 mm Hg and/or systolic blood pressure ≥140 mm Hg was applied.

Table 1: Socioeconomic profile of study subjects (*n*=425)

Particulars		Frequency (*n*)	Percentage
Educational status	Illiterate	38	8.9
	Just literate	63	14.8
	Literate	11	2.6
	Primary	90	21.2
	Middle	83	19.5
	High school	70	16.5
	Intermediate	50	11.8
	Graduate	19	4.5
	Postgraduate and above	1	0.2
Occupation	Agriculturist	73	17.2
	Laborer	107	25.2
	Business	45	10.6
	Service	22	5.2
	Homemaker	148	34.8
	Student	9	2.1
	Unemployed	21	4.9
Classification according to modified B.G. Prasad for year 2019	Social class I	-	-
	Social class II	19	4.5
	Social class III	72	16.9
	Social class IV	272	64.0
	Social class V	62	14.6

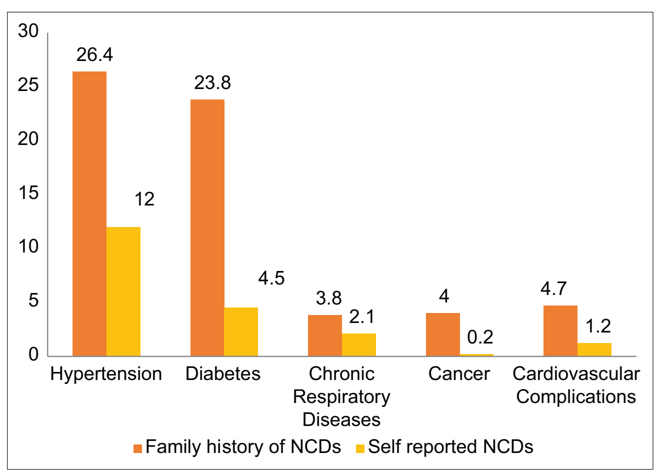

Figure 1: Distribution of family history of NCDs and self-reported NCDs

Associates of raised blood pressure of study subjects with their socioeconomic variables are given in Table 3. As much as 20.6% and 55.2% of subjects from the age group 25–44 and 45–64 years had raised BP ($P < 0.01$). There existed a significant ($P < 0.01$) association between blood pressure of study subjects with their educational status. All the subjects were clubbed in three educational categories and individual category wise blood pressure were determined. There existed a significant ($p < 0.01$) association between blood pressure of study subjects with their educational categories. Category wise prevalence of hypertension were illiterate + just literate + literate – 46.4 %, primary + middle + high – 29.2 % and intermediate and above – 15.7 %. There also existed a significant ($P < 0.05$) association of BP status of subjects with their occupation and socioeconomic class. Hypertension was maximum in subjects involved in labor (37.4%) and from socioeconomic class IV and V (34.4%). There existed no significant ($P > 0.0$) association of the subject's blood pressure status with their gender, religion, caste, residing village, and marital status.

Association of raised blood pressure of study subjects with their familial, programmatic, and risk factor attributes is shown below in Table 4. As many as 44.9% of subjects consuming tobacco and 23.8% of subjects without tobacco consumption were hypertensive ($P < 0.01$). As many as 60.0% of subjects with higher waist circumference, 50.4% with high WHR, and 58.3% of subjects characterized as overweight + pre-obese + obese based on Asian classification using BMI as a parameter were hypertensive; corresponding values in their counterpart were significantly less. There was no significant association of the subject's blood pressure status with their type and size of family, family without NCDs, awareness of screening camps and NPCDCS program, and status of alcohol consumption.

Significant association of education, nutritional status according to Asian BMI, and occupational status of subjects with raised BP obtained in univariate analysis got eliminated in the logistic model. Taking age 25–44 years as reference, risk of hypertension was higher in the age group 45–64 years (AOR: 3.06; 95% CI: 1.75–5.35). In comparison to socioeconomic class II + III, risk of hypertension was more in socioeconomic class IV + V (AOR: 2.24; 95% CI: 1.17–4.31). AORs in subjects consuming tobacco, with high waist circumference, and high WHR were 1.73 (95% CI: 1.02–2.93), 2.93 (95% CI: 1.17–4.60), and 1.98 (95% CI: 1.08–3.62), respectively [Table 5].

Discussion

In India, mortality from NCDs accounted for 65% of total deaths in 2019, and hypertension among all NCDs is a major contributor to death in general and premature mortality in particular.[20]

Table 2: Distribution of study subjects according to their Blood pressure

Particulars	Male (n=225)		Female (n=200)		Total (n=425)		95% CI	Test of Significance
	No.	%	No.	%	No.	%		χ^2, df, P
Diastolic Blood pressure								
<90 mm of Hg	164	72.9	150	75.0	314	73.9	69.7-78.1	0.25, 1, 0.62
≥90 mm of Hg	61	27.1	50	25.0	111	26.1	21.9-30.5	
Systolic Blood pressure								
<140 mm of Hg	176	78.2	160	80.0	336	79.1	75.2-82.9	0.2, 1, 0.65
≥140 mm of Hg	49	21.8	40	20.0	89	20.9	17.1-24.8	

Table 3: Associates of raised blood pressure of study subjects with their socio-economic variables

	Particulars	Total (n)	Blood pressure within range		Raised Blood pressure		Test of Significance		
			No.	%	No.	%	χ^2	df	P
Age in years	25-44 years	291	231	79.4	60	20.6	50.89	1	0.00
	45-64 years	134	60	44.8	74	55.2			
Residing Village	Narayanpur	169	117	69.2	52	30.8	0.13	2	0.94
	Umrahan	144	97	67.4	47	32.6			
	Chittauna	112	77	68.8	35	31.3			
Marital status	With Spouse	351	243	69.2	108	30.8	0.54	1	0.46
	Without Spouse	74	48	64.9	26	35.1			
Educational status	Illiterate + Just literate + Literate	112	60	53.6	52	46.4	20.23	2	0.00
	Primary + Middle + High	243	172	70.8	71	29.2			
	Intermediate and above	70	59	84.3	11	15.7			
Occupational status	Agriculture	73	46	63.0	27	37.0	9.79	3	0.02
	Labor	107	67	62.6	40	37.4			
	Business + Service	67	56	83.6	11	16.4			
	Not engaged in gainful employment	178	122	68.5	56	31.5			
Socioeconomic Class	II + III	91	72	79.1	19	20.9	6.08	1	0.01
	IV + V	334	219	65.6	115	34.4			

Table 4: Association of raised blood pressure of study subjects with their familial, programmatic, and risk factor attributes

Particulars		Total (*n*)	Blood pressure within range		Raised Blood pressure		Test of Significance		
			No.	%	No.	%	χ^2	df	*P*
Type of family	Nuclear	222	157	70.7	65	29.3	1.09	1	0.30
	Joint/3-Gen	203	134	66.0	69	34.0			
Family size	≤3	28	22	78.6	6	21.4	2.61	2	0.27
	4-6	284	197	69.4	87	30.6			
	>6	113	72	63.7	41	36.3			
	4 + 5	334	219	65.6	115	34.4			
Family history of NCDs	Absent	200	135	67.5	65	32.5	0.17	1	0.69
	Present	225	156	69.3	69	30.7			
Awareness regarding NPCDCS Program	No	385	265	68.8	120	31.2	0.25	1	0.62
	Yes	40	26	65.0	14	35.0			
Awareness of Health promotional/Screening Camps	No	346	237	68.5	109	31.5	0.00	1	0.98
	Yes	79	54	68.4	25	31.6			
Tobacco consumption	No	269	205	76.2	64	23.8	20.32	1	0.00
	Yes	156	86	55.1	70	44.9			
Alcohol consumption	No	332	233	70.2	99	29.8	2.06	1	0.15
	Yes	93	58	62.4	35	37.6			
Waist circumference	Normal	320	249	77.8	71	22.2	52.36	1	0.00
	Higher than normal range	105	42	40.0	63	60.0			
Waist Hip ratio	Normal	302	230	76.2	72	23.8	28.57	1	0.00
	Higher than normal range	123	61	49.6	62	50.4			
BMI (Asian criteria)	Underweight	40	33	82.5	7	17.5	48.70	2	0.00
	Normal	277	213	76.9	64	23.1			
	Overweight + Pre-obese + Obese	108	45	41.7	63	58.3			

Table 5: Logistic regression analysis for raised blood pressure of study subjects

Particulars		Estimation of β	SE of β	*P*	AOR	95% CI	
						Lower	Upper
Age	45-64	1.12	0.258	0.000	3.06	1.75	5.35
	25-44*	-	-	-	-	-	-
Education	Illiterate + Just Literate + Literate	0.54	0.45	0.22	1.73	0.71	4.19
	Primary + Middle + High school	0.59	0.41	0.14	1.80	0.81	4.00
	Intermediate and above *	-	-	-	-	-	-
Occupation	Labor	0.81	0.44	0.06	2.24	0.95	5.33
	Agriculture	0.81	0.46	0.08	2.25	0.92	5.52
	Not engaged in gainful employment	0.91	0.44	0.84	1.09	0.46	2.58
	Business + Service*	-	-	-	-	-	-
Socioeconomic Class	Social class IV + V	0.778	0.313	0.013	2.177	1.179	4.017
	Social class II + III*	-	-	-	-	-	-
BMI (Asian Criteria)	Overweight + Pre-obese + Obese	0.76	0.53	0.15	2.13	0.76	5.99
	Normal	0.11	0.47	0.82	1.11	0.45	2.78
	Underweight	-	-	-	-	-	-
Tobacco consumption	Consumed	0.55	0.27	0.04	1.73	1.02	2.93
	Not consumed*	-	-	-	-	-	-
Central obesity as per Waist circumference	Present	0.84	0.35	0.02	2.32	1.17	4.60
	Normal*	-	-	-	-	-	-
Central obesity as per Waist Hip ratio	Present	0.68	0.31	0.03	1.98	1.08	3.62
	Normal*	-	-	-	-	-	-

*Reference. NOTE: The appropriateness of fitted model was 76.2%

According to this study, nearly one out of three subjects were hypertensive. In a cross-sectional study conducted by Chow *et al.*[21] (2007) in rural Andhra Pradesh, the overall prevalence was lower (one out of five) than in the present study. Krishnan *et al.*[22] (2008) in rural Haryana also showed a lower prevalence in male and female subjects. Todkar *et al.*[23] (2009) in a cross-sectional study in Aurangabad, Maharashtra also predicted an overall prevalence much lower than the current study. Stratified multistage sampling design of Stage I of the Indian Council of Medical Research-India Diabetes (ICMR-INDIAB) study conducted over three states (Tamil Nadu, Maharashtra, and Jharkhand) and one union territory (Chandigarh) depicted also an overall prevalence of 26.3% in subjects of age group above 20 years.[24] Oommen *et al*.[25] (2016) concluded the prevalence of hypertension as 17.2% in a cross-sectional study in rural Tamil Nadu. According to a national-level survey by Ramakrishnan *et al*.[26] (2019) for blood pressure conducted on fixed one-day camps under the aegis of the Cardiological Society of India showed the prevalence of hypertension as 30.7%. Findings of overall blood pressure higher than the present study were shown by Thankappan *et al*.[27] (2010) in rural Kerala (32.5%), by Singh *et al*.[28] (2016) in rural Andhra Pradesh (36.4%), by Swaminathan *et al*.[29] (2017) in rural Tamil Nadu (37.8%), by Tushi *et al*.[30] (2018) in rural Nagaland (43.2%), and by Mohanraj *et al*.[31] (2019) in Suburban Tamil Nadu (47.1%).

However, according to National Family Health Survey-4 (NFHS-4), prevalence of hypertension was low compared to our study. NFHS-4 data has revealed that 11% of women and 14.8% of men aged 15–49 have hypertension. There was a consistent and steep increase in the prevalence of hypertension with increases in BMI for both sexes;.29% of obese women and 38% of obese men were found to be hypertensive in NFHS-4.[32] In Uttar Pradesh, 9.2% of women and 11.1% of men were having hypertension. However, prevalence of hypertension in Varanasi district was below the national level. Only 5.1% of women (urban: 5.6%, rural: 4.8%) and 6.4% (urban: 7.4%, rural: 5.6%) of men were hypertensive.[33] A major limitation of the NFHS-4 survey is the inclusion of adults only up to the age of 49 years. Analysis of a cross-sectional survey data from the fourth round (2015–2016) of National Family Health Survey (NFHS) by Ghosh *et al*.[34] (2019) and Kumar and Misra[35] (2021) also showed advancing age, obesity/overweight, male sex, consumption of alcohol, and contrarily high socioeconomic status as the major predictors of hypertension. In coherence with the present study findings, a multivariate regression analysis done in ICMR-INDIAB study by Bhansali *et al*.[36] (2015) and a quantitative analysis by Rao *et al*.[37] (2013) in coastal Karnataka also identified advancing age, central obesity, overweight, and obesity as defined by BMI as significantly correlated for hypertension by multivariate logistic regression. A study conducted in nine villages of a rural block of Vellore district, Tamil Nadu by Oommen *et al*.[25] (2016) also revealed that hypertension was significantly associated with increasing age, male sex, urban residence, use of alcohol, scheduled caste status, low physical activity, BMI ≥25 kg/m^2, central obesity, and a family history of hypertension. In contrast to a present result, studies by Parthaje[38] (2016), Bhise and Patra[39] (2018), Corsi and Subramanian[40] (2019), Prenissl *et al*.[41] (2019), Patel *et al*.[42] (2020) showed higher odds for hypertension for higher household economic status and higher educational status. The possible explanations for the lower prevalence of hypertensive subjects among higher education and higher socioeconomic class in this study may be attributed to better awareness of hypertension prevention and control measures, better adherence to medical advice, including lifestyle modifications among higher socioeconomic status groups, as well as possible higher job strain among lower socioeconomic status groups.

Variations in the extent of hypertension in the abovementioned studies may be due to disparity in settings, attributes of study subjects, and differences in time frame. In India, Primary Health Care facilities happen to be the first point of contact of the population with health services. This is also valid for detection and management of NCDs in general and hypertension in particular. The findings of this study provide significant inputs for prevention, screening, and focused attention of subjects from rural India.

Globally, 51% of men and 41% of women, that is, 580 million individuals in total were unaware of their condition because they were never diagnosed with hypertension.[43] This calls for concerted efforts by primary healthcare physicians in the early diagnosis and timely management of the condition.

Well representative sample of adults and use of pretested and validated tools stands out to be the strength of the study. However, the cross-sectional nature of the survey only provides the burden of hypertension at a point in time. The study focuses only on the rural adult population; thus, the nation-based estimates are desirable. A large community-based study including both rural and urban populations is required to ascertain the exact prevalence and predictors of hypertension in the community. Social desirability bias may have led to over or under-reporting related to tobacco and alcohol.

This study reflects three out of ten study subjects as hypertensive; subjects in higher age range, from lower socioeconomic class, tobacco consumer and with high waist circumference as well as WHR as predictors for hypertension.

The study refutes the age-old concept that hypertension is not a major problem in rural India. There is a big chunk of the population unaware of their hypertension status. The findings of the study give the message that focus should shift from expensive tertiary care to primary health care settings for combating lifelong management of hypertension.

Conclusion

Three out of ten subjects were hypertensive. Advancing age, tobacco dependence, socioeconomic adversities, and high central obesity predisposed individuals to hypertension.

These findings call for targeted attention for maximum risk reduction in terms of dietary modification, optimum nutrition, and increased physical activity for curbing hypertension in rural subjects.

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Conflicts of interest

There are no conflicts of interest.

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