

Original Research Article

A cross sectional community-based study to determine prevalence of high blood pressure and its associated risk factors amongst women residing in rural area of Navsari district in Gujarat

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ABSTRACT

Background: The increase in prevalence of hypertension is evident in urban as well as rural areas over the years from trend studies. The objectives of this study were to determine prevalence of high BP and to assess the magnitude of undiagnosed high BP cases amongst women residing in the study area.

Methods: 28 Villages which are the field practice area of Gram Seva Trust Sarvajani Hospital, Kharel were selected. Women above 25 years of age and wanted to participate in women's health screening camps were included.

Results: 31% belonged to the age group of 36 to 45 years. 49.7% among the study participants were engaged in farm labor. 25.4% women were underweight. As per the JNC-7 criteria it was found that 13.7 % and 7.4% women were in stage 1 and stage 2 respectively. 21.6% women were in the pre-hypertension stage. 82% women were newly diagnosed and didn't know that they were hypertensive. Significant relation between high body mass index (BMI) and hypertension was found. However, the prevalence of high BP amongst underweight and normal BMI women was alarming (13.1% and 19.8% respectively).

Conclusions: There is significant burden of women with high BP in rural areas in Navsari district. This invites for immediate population and high-risk approach to lower blood pressure in the community and thereby reducing the risk of cardiovascular diseases.

Keywords: Prevalence, High BP, Body mass Index, Newly detected, Rural area, Screening

INTRODUCTION

Globally, the overall prevalence of hypertension in adults aged 25 years and above was 40% in 2008. The prevalence in India as per the study by Indian council of medical research (ICMR) was 25% among urban population and 29% among rural population when systolic BP of 140 and above and/or diastolic BP of 90 or above were considered as hypertension. The prevalence of hypertension is increasing over the years globally. In India, this increase is evident in urban and rural areas

over the years from trend studies. Compiled study reports from 1949 to 1999 shows gradual increase in prevalence in both urban and rural areas in India.¹

Raised blood pressure is a major risk factor for chronic heart disease, stroke, and coronary heart disease. Elevated BP is positively correlated to the risk of stroke and coronary heart disease. Other than coronary heart disease and stroke, its complications include heart failure, peripheral vascular disease, renal impairment, retinal hemorrhage, and visual impairment.²

This rising epidemic reflects the profound changes in society and in behavioral patterns of communities over recent decades. Among non-communicable disease (NCDs), Hypertension, with all its variegates, affects the entire spectrum of the population, including men, women, and even the children.³

The objectives of the present study were to determine prevalence of High BP and to assess the magnitude of undiagnosed High BP cases amongst women residing in the study area.

METHODS

This community based cross sectional study was carried out for the period of 1 year from 1st April 2018 to 31st March 2019 in 28 Villages that comes under 4 Primary Health Centers, (Dhanori, Tankal, Kangvai, Ranverikalla) which are the field practice area of Gram Seva Trust Sarvajani Hospital, Kharel, District-Navsari. Women above 25 years of age and wanted to participate in women's health screening camps were included. Women who didn't give consent to participate in study were excluded. Participants were selected using non-probability convenience sampling method. Study was divided into 4 phases for better results and good understanding of the participants. In 1st phase by using simple random sampling method, house to house visits were conducted in all the village area and information, education and communication (IEC) meetings at the convenient place were organized by the supervisors of the institute with the help of field level workers. In 2nd phase health talk was delivered at these meetings and information on risk factors, signs, symptoms, complications, precautions to be taken and steps to prevent hypertension and other diseases like cervical cancer, breast cancer were given. A part from health talk women were also informed about screening camp at their village's primary health center on specified date. Total 3001 women attended village level IEC meetings and out of that 2352 women attended screening camps, 2314 women out of 2352 gave consent for blood pressure measurement. After considering all the above-mentioned factors, the sample size of present study was 2314. In the 3rd phase, after taking informed consent, blood pressure measurement was done by the medical officer. In 4th phase, women who had any complaint were referred to Gram Seva Trust Sarvajani Hospital, Kharel for further management. Blood pressure measurement was a part of screening of the women who came for the cervical cancer screening program. Systolic BP of ≥ 140 and/or diastolic BP of ≥ 90 mmHg are the currently accepted standard threshold for diagnosis of hypertension worldwide, although the 2017 American College of Cardiology/American Heart Association (ACC/AHA) hypertension guidelines have proposed a lower threshold of ≥ 130 and/or ≥ 80 mmHg.⁵ Microsoft excel 2013 and SPSS version 20.0 were used for frequency analysis. Chi-square test was applied to check the association between demographic variables and risk factors.

RESULTS

A total of 2352 women took part in our women's health screening program and out of that, screening of blood pressure was done of 2314 women. Out of total 2352 women, 31% belonged to the age group of 36 to 45 years, 27.7% belonged to 25-35 years of age and 21.1 % of women belonged to 45-55 years of age. The literacy profile showed 27.5% illiterate while 32.6% having a primary education, 23.5% having secondary education, 10.7% had studied up to higher secondary, 5.4% were graduated. Majority i.e. 49.7% among the study participants were engaged in farm labor and 46.3% were housewives, 4.7% women were doing some sort of business, 3.3% were doing job and 0.1% were studying. Most of the women were married (83.5%) with others being widowed (15%), unmarried (0.8%) and divorced (0.6%) (Table 1).

Table 1: Socio demographic profile of study population.

Variables	N	Percentage
Age (in years)	<25	76
	25-35	651
	36-45	729
	46-55	496
	56-65	321
	>65	78
Occupation	Small scale retailer	11
	Farming	1160
	Homemaker	1082
	Job	78
	Student	3
Education	Graduate	124
	Higher secondary	246
	Secondary	537
	Primary	743
	Illiterate	629
Marital Status	Married	1879
	Widow	338
	Unmarried	18
	Divorce	14
Social groups	ST	1791
	SC	31
	Other Backward Caste	130
	General	362

After distributing women on the basis of their body mass index (BMI) values it shows that 4.3% women were obese while 16.7% were overweight. While 25.4% women were under weight and 53.6% were having normal BMI value. After taking blood pressure and

distributing the blood pressure values as per the JNC-7 criteria it was found that 13.7 % and 7.4% women were in stage 1 (140-159/90-99) and stage 2 ($\geq 160/\geq 100$) respectively. 21.6% women were in the pre-hypertension stage while 57.3% women were having normal blood

pressure. As shown in the 3rd number row of the (Table 2) the overall prevalence of hypertension was 21.1% and out of that majority i.e. 82% women were newly diagnosed and didn't know that they were hypertensive.

Table 2: Distribution of participants on the basis of various observations.

Indicator	Limit	No of respondents	Percentage
BMI (kg/m²)	Underweight (BMI <18.5)	594	25.4
	Normal (BMI 18.5–24.9)	1250	53.6
	Overweight (BMI 25–29.9)	389	16.7
	Obese (BMI ≥ 30)	101	4.3
Stages of High BP [JNC-7] (in mmHg)	Normal (<120 / <80)	1325	57.3
	Pre-hypertension (120-139 / 80-89)	500	21.6
	Stage 1 hypertension (140-159 / 90-99)	318	13.7
	Stage 2 hypertension ($\geq 160 / \geq 100$)	171	7.4
Prevalence of high BP	Normal	1825	78.9
	High BP	489	21.1
Status of high BP individuals	Newly detected	401	82.0
	Already diagnosed	88	18.0

Table 3: Relation of risk factors with prevalence of high BP.

Indicator	Indicator	High BP	Normal BP	%	P value
Age	<25	2	70	2.8	0.00
	25-35	40	599	6.3	
	36-45	131	590	18.2	
	46-55	143	343	29.4	
	56-65	128	190	40.3	
	>65	45	33	57.7	
BMI Status	Underweight	77	509	13.1	0.00
	Normal	244	991	19.8	
	Overweight	121	265	31.3	
	Obese	44	56	44	
Diet	Mixed	274	977	21.9	0.63
	Vegetarian	146	550	20.9	
Education	Illiterate	203	419	32.6	0.00
	Primary	135	596	18.5	
	Secondary	78	447	14.9	
	Higher secondary	35	207	14.5	
	Graduate	21	102	17.1	
Occupation	Business	2	8	20	0.00
	Farm labour	235	910	20.5	
	Homemaker	241	823	22.7	
	Job	7	68	9.3	
	Student	0	3	0	
Social Group	OBC	31	99	23.8	0.67
	OPEN	79	283	21.8	
	ST / SC	379	1443	20.8	

Table 3 shows the relation of various risk factors with the prevalence of High BP, if we compare age group of the women with their blood pressure values it was found that there is a significant increase in the prevalence, as the age advances [Chi sq. $p=0.00$]. Similarly, after distributing participants body mass index (BMI) values it was found that hypertension was more prevalent amongst those who were overweight (31.3%) and obese (44%) as compared to normal (19.8%) and underweight (13.1%) individuals. [Chi sq. $p=0.00$] The prevalence of hypertension was slightly higher (21.9%) in participants who were consuming mixed diet than those who were consuming only vegetarian diet (20.9%). However, there was no statistical significance [$p=0.63$]. Statistically significant relation [$p=0.00$] was observed between individual's education and hypertension. The prevalence was significantly higher amongst those who were illiterate (32.6%) than the others (Table 3).

DISCUSSION

The prevalence of hypertension amongst women in the present study was 21.1%, which was higher in comparison with the prevalence reported in Galav et al (18.79%),⁶ in Kadu et al study the prevalence amongst women was lower than present study (12.52%).⁷ And Singh et al also reported lower prevalence (15.2%) than present study.¹¹ However in Kannan et al study the prevalence was higher than the present study (27.4% in women).¹⁸ In Fourth District Level Household Survey, prevalence of hypertension amongst women was 20.0%.⁵ which was somewhat in line with the present study. According to World Health Organization (2015), the prevalence of hypertension in India was 23.5% and gender specific prevalence in women was 22.7%.⁸

In present study it was observed that as the age advances the risk of becoming hypertensive also increases and a notable rise in prevalence of hypertension was observed in the fifth decade generation (56-65 years). Similar age related observation was found in Kumar et al study.¹⁷ on the contrary, highest rate of rise of hypertension was found in the youngest age group (35-44 years) in Roy et al study.¹⁰ In present study, highest prevalence (57.7%) of Hypertension was observed amongst the elderly age group (>65 years). similar result was found by Tripathy et al (60%).⁹

In this study significant relation between high BMI and hypertension was found. Similar trend was observed in most of the studies.⁹⁻¹¹ However in present study the prevalence of high BP amongst underweight and normal BMI women was alarming (13.1% and 19.8% respectively). For every 10% increase in weight, a rise of 6.5 mm Hg in systolic pressure was observed in Garrison et al study.¹³ whereas no significant relation was observed between dietary habits and hypertension. However, in present study, participants were only asked about whether they were consuming mixed diet or only vegetarian diet and salt intake was not taken into consideration as far as

the question of diet is concern. Radhika G et al have found positive relation between high salt intake and prevalence of hypertension.¹²

In present study, high prevalence (32.6%) of hypertension was found amongst illiterate participants. This could be because most of the elderly were illiterate. Similar results were found in Tripathy et al study.⁹ Kishore et al and Wang et al also reported similar findings.^{15,16} in contrary to that, insignificant association between education and hypertension was observed in Vimala et al study.¹⁴

In this study 82 % participants were newly detected high BP. In Tripathy et al study 69.9% hypertensives were newly diagnosed.⁹ while in Kannan et al study, 50.8 % participants were newly diagnosed.¹⁸ higher percentage of newly diagnosed participants in present study clearly indicates the need of the similar screening programs and strong IEC activities in the community.

CONCLUSION

It can be concluded that there is significant burden of women with high BP in rural areas in Navsari district. This invites for immediate population and high-risk approach to lower blood pressure in the community and thereby reducing the risk of cardiovascular diseases. Age, high BMI levels were risk factors of hypertension in the present study. However, prevalence of high blood pressure amongst underweight and normal BMI women was also high. Improving awareness towards hypertension as well as other NCDs is also the need at this moment. Higher number of newly diagnosed hypertensive participants indicates that exclusive as well as opportunistic screening for hypertension should be carried out to identify hidden pool of the disease.

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