

Prevalence of Hypertension in the Rural Community of Central Maharashtra, India

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ABSTRACT

BACKGROUND: Hypertension is the commonest risk factor for cardiovascular disorder and though it is preventable diseases by very easy means like avoidance of risk factors and regular blood pressure screening and treatment but still very neglected. There is a paucity of data on the prevalence of hypertension in rural India and this study was done to determine the same amongst rural population in the field practice area of S.R.T.R. Medical College, Ambajogai, Beed, India. **OBJECTIVE:** To find out the prevalence of hypertension among adults of the rural community and to classify them according to the classification given by JNC7. **Study design:** community based cross sectional study. **Study area:** Village Chanai, the field practice area of Department of Preventive and Social Medicine, S.R.T.R. Medical College, Ambajogai, Beed, Maharashtra, India. **Study population:** whole the population of village Chanai i.e. 2235 aged 18 years and above was screened by house to house survey for hypertension. 39 subjects were excluded according to exclusion criteria and finally 2196 study subjects were included in the study. **Inclusion Criteria:** All population of selected village above 18 years of age. **Exclusion Criteria:** 1. All pregnant women, 2. Subjects who were not willing for the interview or examination. Two readings of blood pressure were taken 3 minutes apart and the average was noted with standardized mercury sphygmomanometer throughout the study. **OBSERVATIONS:** Overall prevalence of hypertension was found to be 12.75% and it increased significantly with the age. Sexwise prevalence was slightly higher in males i.e. 13.10% whereas it was 12.52% in females and it also increased in both sexes with age. Most of the cases of hypertension i.e. 55.71% belonged to stage II of hypertension in both male and female. **CONCLUSION AND RECOMMENDATION:** Prevalence of hypertension in village Chanai rose by double in merely seven years i.e. from 5.92% to 12.75%. Most of the patients had first time exposed to the blood pressure recording procedure during the study and diagnosed as hypertensive indicating the lack of awareness about warning symptoms, risk factors, importance of BP screening and ideal time of BP screening. So there is a need for strengthening health & nutritional education programs promoting hypertension awareness, and emphasizing preventive measures. Multipurpose health workers can be trained for detection and monitoring of hypertension. Community interventional programs targeting the 1st degree blood relatives of the cases of hypertension should be given priority.

Key words: Hypertension; Blood pressure; Prevalence; Adults; Rural India; JNC7

INTRODUCTION

Hypertension provides both despair and hope: despair because it is quantitatively the largest risk factor for

cardiovascular diseases (CVD), it is growing in prevalence, and it is poorly controlled virtually everywhere; and hope because prevention is possible (though rarely achieved) and treatment can effectively control almost all patients, resulting in marked reductions in stroke and heart attack.¹

In Indian prevalence of hypertension has been estimated to be between 20% to 40% in urban adults and 12% to 17% (even upto 20%) in rural adults. The estimated number of Indians with hypertension was 120 million in year 2000, which is likely to expand to 200 million by 2025, with equal numbers among men and women.²

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Framingham Heart Study investigators recently reported the lifetime risk of hypertension to be approximately 90 percent for men and women who were nonhypertensive at 55 or 65 years and survived to age 80–85 years and also indicated that BP values between 130–139/85–89 mmHg are associated with a more than twofold increase in relative risk from cardiovascular disease (CVD) as compared with those with BP levels below 120/80 mmHg.³

Because of changes in life style, changes in environment, the problem of hypertension is increasing.

Despite the fact that high blood pressure is easy to detect by means of simple, widely available measuring device, majority of hypertensives are unaware of their condition. Among those who are aware of high blood pressure many of them do not seek regular treatment.

Although WHO expert committee on cardiovascular diseases and hypertension emphasized the importance of epidemiological surveys to establish the prevalence and risk factors contributing to hypertension, most of the studies on arterial blood pressure in India have been concerned with the urban population and the rural sector though constitutes 74% of the Indian population, is grossly neglected.⁴

So, there is a paucity of data on the prevalence of hypertension in rural India and this study was done to determine the same amongst rural population of field practice area of S.R.T.R. Govt. Medical College in Maharashtra.

METHODOLOGY

I) Aim and Objectives

To find out the prevalence of hypertension among adults of the rural community and to classify them according to the classification given by JNC7.

II) Type of Study

Community based cross sectional study.

III) Study Area

Village Chanai, the field practice area of Department of Preventive and Social Medicine, S.R.T.R. Medical College, Ambajogai, Beed, Maharashtra, India

IV) Study Period

The present study was carried out in January to June 2010.

V) Study Population

Whole population aged 18 years and above was screened by house to house survey for hypertension. During this survey, the actual population screened was 2235. This number was less than the expected according to Vidhansabha (Legislative Assembly) voter's list i.e.2900 (study universe), as some families went to other places for harvesting sugarcane and some population was staying outside for employment, service and for educational purpose. Afterwards out of this 2235 screened population, 39 subjects were excluded according to exclusion criteria and finally 2196 study subjects were included in the study.

VI) Inclusion Criteria

All the population of village including both males and females above 18 years of age.

VII) Exclusion Criteria

1. All pregnant women.
2. Subjects who were not willing for the interview or examination.

VIII) Method

Ethical clearance from our institutional Ethical Committee was obtained.

The objective of the study and the method was explained to the local leader of the village and information regarding total population, various localities, rough map of village, and voter's list were collected.

Initially, pilot study was undertaken for pretesting the proforma and for feasibility. The necessary modifications were made accordingly.

For identification and initial contact, the help of the medical social worker was obtained. Prior intimation was given to families to minimize non response. Efforts were made to include whole population of 18 years and above by visiting houses twice subsequently. House to house visits were paid by the investigator between 8 am to 11 am everyday and on an average 4–5 families were screened per day. Subjects having the history suggestive of secondary hypertension were excluded.

Blood Pressure Measurement

Casual blood pressure reading were taken by a single observer for every individual as per the guidelines given by WHO 1978⁵ and by "The Seventh Report Of The Joint National Committee On Prevention, Detection,

Evaluation And Treatment Of High Blood Pressure” (2003)³ throughout the study. Training in all relevant techniques was obtained by the observer including care for avoiding expectation error and digit preference.

The subject was made to sit on the ground comfortably. It was seen that the subjects had not made any vigorous effort during preceding 60 minutes, smoked or taken coffee or tea, food and had sound sleep on the previous night.

All readings were taken on the right arm. Two readings of blood pressure were taken. Each reading was taken about 3 minutes apart and average reading was noted. If the first readings differed by more than 5 mm of Hg, additional reading was taken and average of the three readings was noted. The forearm was kept at the level of the heart. The sphygmomanometer was also kept at the level of the heart.

The Instrument

A standard ISI marked mercury sphygmomanometer was used throughout the study to minimize the instrumental error. Manometer was standardized monthly.

Criteria for Classification of High Blood Pressure

For classification of high blood pressure the criteria laid down by ‘The Seventh Report of Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure’ (2003)³ were followed.

Classification of hypertension by blood pressure level:

Blood Pressure Classification	SBP mmHg	DBP mmHg
Normal	<120	and <80
Prehypertension	120–139	or 80–89
Stage 1: Hypertension	140–159	or 90–99
Stage 2: Hypertension	>160	or >100

When the systolic and diastolic blood pressure falls into different categories, the higher category was taken to classify the individual’s blood pressure.⁶

OBSERVATION

Table 1 shows age wise distribution of hypertensives.

Out of 2196 surveyed population, there were 280 cases of hypertension giving 12.75% overall prevalence. The age specific prevalence of hypertension was found to

be 1.17% in 18–29 years age group, 3.64% in 30–39 years age group, 7.68% in 40–49 years age group, 32.23% in 50–59 years age group, 36.22% in 60–69 years age group, 43.52% in 70–79 years age group and 61.54% in 80 years and above age group.

The age range of the hypertensives was 26 to 90 years and mean age of the hypertensives was found to be 57.58 ± 13.36 years.

Thus the highest prevalence of hypertension was observed in ≥80 years i.e. 61.54% followed by 43.52% in age group 70–79. The lowest prevalence was found to be 1.17% in age group of 18–29 years.

Chi square test revealed the significant association between age group and prevalence of hypertension and

Table 1: Distribution of Hypertensives According to Age Wise Prevalence of Hypertension

Age group (In Years)	Total population Screened	No. of Hypertensives	Prevalence of Hypertension
18–29	598	07	1.17%
30–39	550	20	3.64%
40–49	456	35	7.68%
50–59	273	88	32.23%
60–69	185	67	36.22%
70–79	108	47	43.52%
≥ 80	26	16	61.54%
Total	2196	280	12.75%

Figures in parenthesis show horizontal percentages.

$\chi^2 = 455.97, df= 6, p<0.001.$

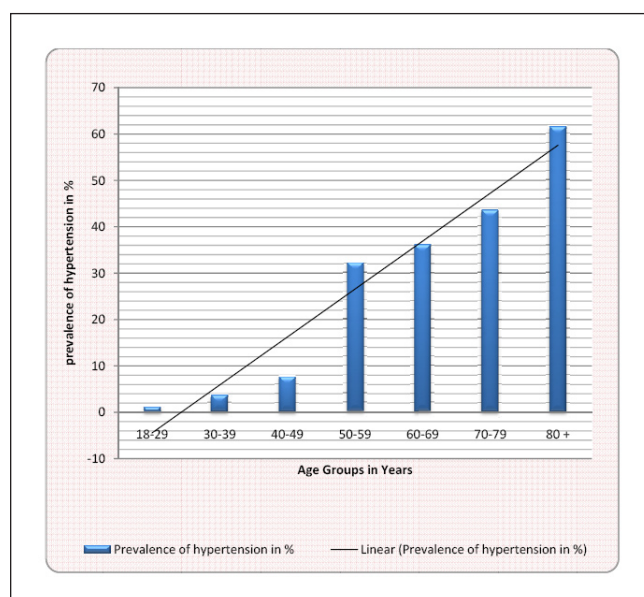


Figure 1: Distribution of Hypertensives According to Age Wise Prevalence of Hypertension.

Figure 1 depicts that prevalence of hypertension increased significantly as the age increased.

Table 2 shows sex wise distribution of hypertensives.

Out of 2196 surveyed population, 870 (39.62%) were males and 1326 (60.38%) were females.

Out of 870 males, 114 had hypertension giving a prevalence of 13.10% and there were 166 hypertensive females out of 1326 females giving a prevalence of 12.52%. Thus the males had higher prevalence of hypertension than females. However no significant difference was found in the prevalence of hypertension between males and females.

Table 3 shows the age and sex wise distribution of hypertensives.

The age wise prevalence of hypertension in males was 1.26% in 18–29 years age group, 4.55% in 30–39 years age group, 7.69% in 40–49 years age group, 32.11% in 50–59 years age group, 38.02% in 60–69 years age group, 47.50% in 70–79 years age group, 66.67% in 80 years and above age group.

The age wise prevalence of hypertension in females was 1.11% in 18–29 years age group, 3.03% in 30–39 years age group, 7.66% in 40–49 years age group, 32.32% in 50–59 years age group, 35.09% in 60–69 years age group, 41.18% in 70–79 years age group, 58.82% in 80 years and above age group.

In the present study, age range of the male hypertensives was 27–85 years and in female hypertensives was 26–90 years. The mean age of female hypertensives was slightly more (57.90 ± 13.58) as compared to mean age of male hypertensives (57.11 ± 13.08) and this difference was

Table 2: Distribution of hypertensives according to sexwise prevalence of hypertension.

Sex	Total population Screened	No. of Hypertensives	Prevalence of Hypertension
Male	870	114	13.10%
Female	1326	166	12.52%
Total	2196	280	12.75%

Z = 0.397, p>0.05.

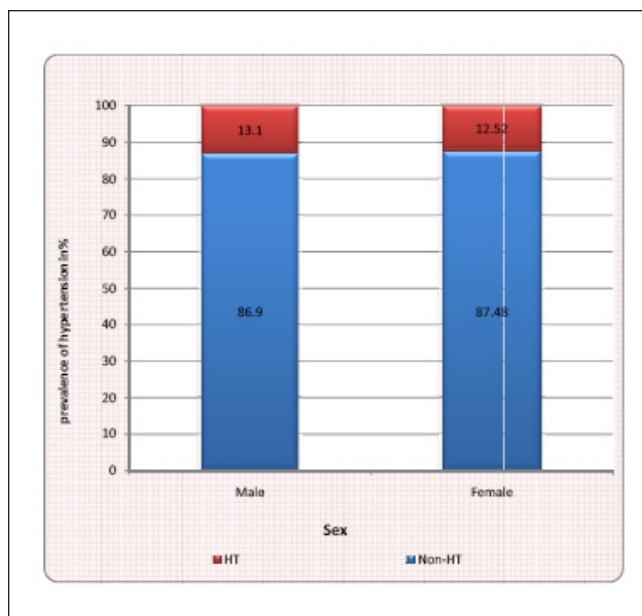


Figure 2: Distribution of hypertensives according to sexwise prevalence of hypertension

found to be statistically not significant (Z=0.488, p>0.05), hence the age groups in both male and female were comparable.

Thus in both the groups the higher prevalence was found in ≥ 80 followed by 70–79 years.

Table 3: Distribution of hypertensives according to age and sex wise prevalence of hypertension.

Age group (in years)	Male			Female		
	No. of Screened	No. of Hypertensives	Prevalence of Hypertension	No. of Screened	No. of Hypertensives	Prevalence of Hypertension
18-29	239	03	01.26%	359	04	01.11%
30-39	220	10	04.55%	330	10	03.03%
40-49	182	14	07.69%	274	21	07.66%
50-59	109	35	32.11%	164	53	32.32%
60-69	71	27	38.03%	114	40	35.09%
70-79	40	19	47.50%	68	28	41.18%
≥ 80	09	06	66.67%	17	10	58.82%
Total	870	114	13.10%	1326	166	12.52%

Male $\chi^2 = 185.86$, df= 6, P<0.001.

Female $\chi^2 = 271.66$, df= 6, p<0.001.

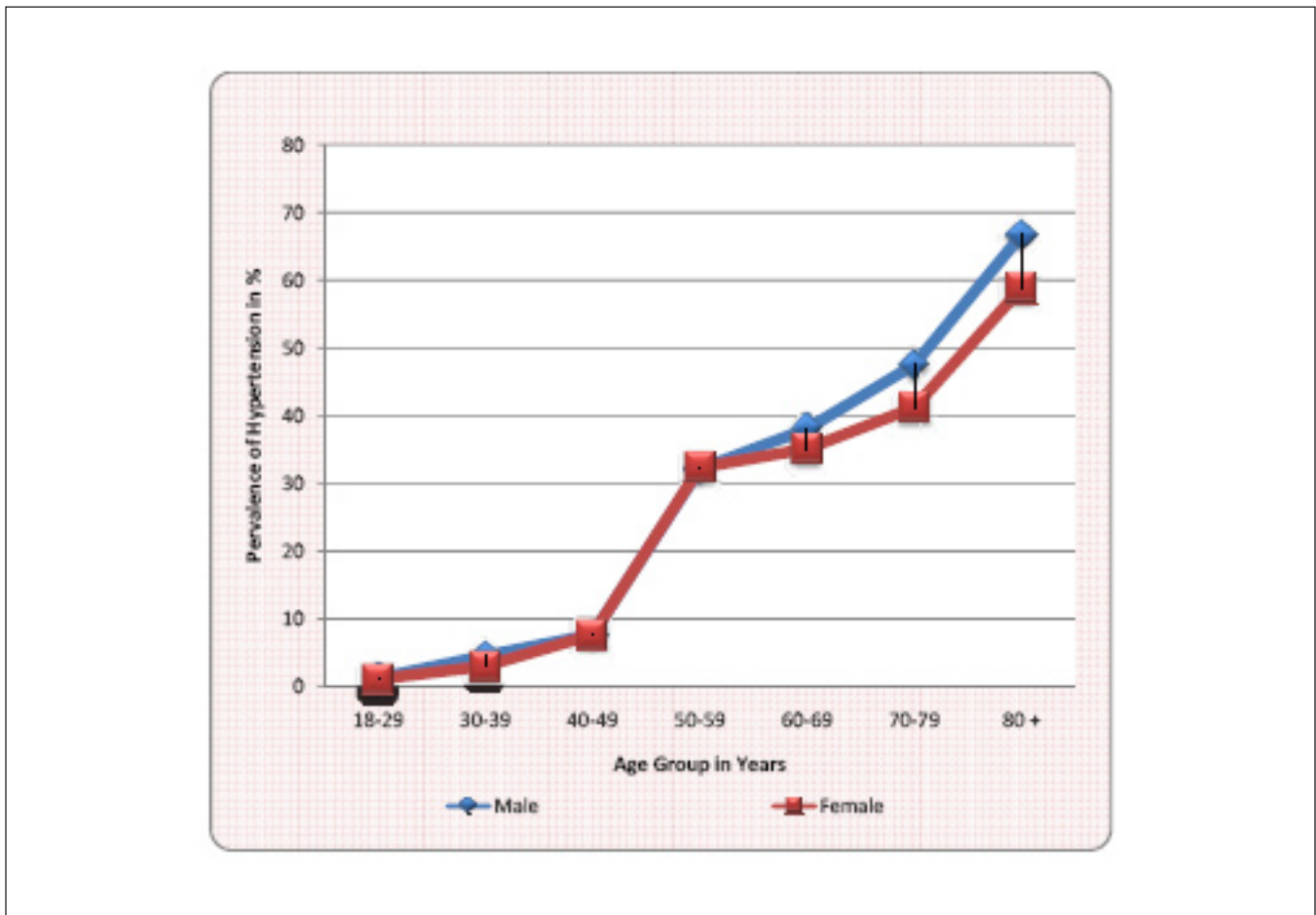


Figure 3: Distribution of hypertensives according to age and sex wise prevalence of hypertension.

Chi square test revealed the significant association between age of the hypertensives and prevalence of hypertension in both male and female separately ($p < 0.001$) and Figure 3 depicts that there was similar trend in both male and female that the prevalence of hypertension increased with increasing age in both sexes.

Thus age seems to play an important role in hypertension in both males and females.

Table 4 shows the distribution of hypertensives according to severity of hypertension.

According to the criteria laid down by ‘The Seventh Report of Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure’ (2003) for classification of high blood pressure, out of 280 hypertensive cases 108 (38.57%) fell in stage I of hypertension, 156 (55.71%) cases were in stage II of hypertension and 16 (05.72%) cases were diagnosed cases of hypertension but at the time of screening they

were having normal blood pressure and were under treatment.

Thus most of the cases of hypertension i.e.55.71% belonged to stage II of hypertension in both male and female.

DISCUSSION

Table 1: In the present study, Out of 2196 surveyed population, there were 280 cases of hypertension giving 12.75% overall prevalence. Overall prevalence of hypertensives by Deshmukh PR *et al.* (2005)⁷ was the prevalence as 20.6%, Reddy SS, Prabhu GR (2005)⁸ as 8.6%, Gupta AK *et al.* (2006)⁹ as 7.78%, Omuemu VO *et al.* (2006)¹⁰ as 20.2%, Patnaik L *et al.* (2007)¹¹ as 10.7%, Raina DJ, Jamwal DS (2009)¹² as 13.0%, Todkar SS *et al.* (2009)¹³ as 7.24%, Yuvaraj BY *et al.* (2010)¹⁴ as 19.1%. The present study findings were comparable with above studies.

Table 4: Distribution of hypertensives according to severity of hypertension

Severity of Hypertension	Male		Female		Total	
	No.	%	No.	%	No.	%
Stage I (Systolic=140–159 Diastolic=90–99)	44	38.60	64	38.55	108	38.57
Stage II (Systolic= ≥ 160 Diastolic= ≥ 100)	66	57.90	90	54.22	156	55.71
Previously Hypertensive but now Normotensive	04	03.50	12	07.23	16	05.72
Total	114	100.00	166	100.00	280	100.00

Similar type of study at same locality with same composition of population was conducted 7 years back by Khadilkar HA *et al.* (2004).¹⁵ They found 5.92% as prevalence of same Chanai village and in the present study we found it to be 12.75%. This reveals the fact that in mere 7 years the prevalence rose to more than double. Now from these figures we can imagine the rapid progression of this non communicable disease epidemic even in rural India.

Table 2: Prevalence of hypertension in male i.e.13.10% was comparable with the study findings of Deshmukh PR *et al.* (2005),⁷ Reddy SS *et al.* (2005),⁸ Gupta AK *et al.* (2006),⁹ Patnaik L *et al.* (2007),¹¹ Raina DJ, Jamwal DS (2009),¹² Yuvaraj BY *et al.* (2010).¹⁴

Similarly, Prevalence of hypertension in female i.e.12.52% was comparable with the prevalence reported by Deshmukh PR *et al.* (2005),⁷ Reddy SS *et al.* (2005),⁸ Omuemu VO *et al.* (2006),¹⁰ Patnaik L *et al.* (2007),¹¹ Raina DJ, Jamwal DS (2009),¹² Todkar SS *et al.* (2009),¹³ Yuvaraj BY *et al.* (2010).¹⁴

Table 3: There was a significant increase in the prevalence of hypertension with increasing age in both sexes

The present study findings were in accordance with Reddy SS *et al.* (2005),⁸ Das Shyamal Kumar *et al.* (2005),¹⁶ Raina DJ, Jamwal DS (2009),¹² Khadilkar HA *et al.* (2004)¹⁵ and Yuvaraj BY *et al.* (2010).¹⁴

CONCLUSION & RECOMMENDATIONS

- Though it is common belief that hypertension is a disease of affluence still this study showed significantly higher prevalence in rural and poor India. It was also concluded from the study that prevalence of hypertension increases as the age increases in both the sexes with maximum hypertensive in stage II of hypertension.

- Most of the patients had first time recorded the blood pressure during the study and diagnosed as hypertensive indicating the lack of awareness about warning symptoms, risk factors, importance and time of BP screening etc.
- Awareness campaign through information, education and communication (IEC) should be carried out to sensitize the hidden hypertensives to get themselves examined and get detected as hypertensives.
- Community interventional programs targeting the 1st degree blood relatives of the cases of hypertension should be given priority.
- Multipurpose health workers can be trained for detection and monitoring of hypertension.
- People from lower socioeconomic group should also be kept under surveillance for detection of hypertension.

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