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Prevalence and Risk Correlates of Hypertension among Adults in Rural Field Practice Area of Tertiary Care Medical College at South India.

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ABSTRACT

Background: In India, lifestyle diseases were considered in the urban setting; so the medical fraternity has concentrated more on the urban people. With epidemiological transition, a dramatic reduction in physical exercise has been observed in the rural areas with an increase in the stresses of life. According to World Health Report 2002, cardiovascular diseases will be the largest cause of death and disability by 2020 in India; the contributing factors are increasing hypertension, dyslipidemia, diabetes, overweight or obesity, physical inactivity, and using tobacco. Our study aims to determine prevalence of hypertension in an adult rural community and to identify the risk factors of Hypertension among adults in Rural Field Practice Area Singanodi of Navodaya Medical College, Raichur, Karnataka**. Methods**: The present study is a cross sectional study, carried out in village Singanodi, which is designated as rural field practice area of Community Medicine Department, Navodaya Medical College. It has population coverage of 14,200.The study population include all subjects who were aged 30 years and above. The present study was a population based study**. Results:** Out of total population, 240 (37.3%) were in age group of 30-39 years, 222 (34.5%) were in age group of 40-49 years. Males and females were 386 (60.03%) and 257 (39.97%) respectively. Our study revealed that hypertension was significantly associated with body mass index, maximum in obese patients when compared to normal and underweight ($p<0.0001$) There is significant association between smoking and hypertension 77 (29.9%). ($p<0.015$) There is significant association with physical activity; that is sedentary people were more prone for getting hypertension when compared to heavy worker. However, salt intake > 6 grams/day and family history of hypertension were found to be significantly associated. ($p=0.009$; $p=0.003$ respectively) The prevalence of hypertension among subjects on vegetarian diet vs. mixed diet was 23.9% vs. 22.2%, respectively but the difference was not statistically significant. ($p= 0.09$) **Conclusion:** From our study we conclude that there is a high prevalence of hypertension even in rural area and advocate to flourish awareness regarding modifiable risk factors of hypertension among the people.

Keywords: Cross sectional study, Hypertension, Risk factors, Rural area.

INTRODUCTION

Hypertension (HTN) is the commonest cardiovascular disorder affecting at least 20% of adult population in several countries. It is one of the important risk factors for cardio-vascular mortality accounting for 20-30% of all deaths1. It became evident in the early 1970s itself that only about half of the hypertensive subjects in the general population of most developed countries were aware of the condition, only about half of those aware of the problem were being treated. If this is the situation with highly developed medical services, the proportion treated in developing countries would naturally be far less.[1].

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It is an interesting as well as a dangerous disease entity. It remains silent without any symptoms but causes continuous damage to person's cardio vascular system. For the same reason WHO has given the name "SILENT KILLER" as the disease does not cause any harm by itself but predisposes to other cardiovascular diseases like stroke, myocardial infarction etc. It is a major risk factor for cardiovascular disease, chronic renal disease and stroke.[1]

Today, hypertension is the huge worldwide general wellbeing issue and commonest cardiovascular wellbeing emergency. As of late, the predominance of the hypertension has been perpetually expanding in India and other creating nations yet comprehension and endeavors to intercede remains hopelessly poor.[2] High blood pressure per se is a quiet disorder to be typically asymptomatic till the end organ damages show the symptoms and signs-WHO has named it the "Silent Killer".[3] Studies have reported hypertension as a significant public health problem in India with an estimated load of 10-15% in rural and

25-30% in urban population.[4-6] Hypertension is directly responsible for 57% of all strokes deaths and 24% of coronary heart disease (CHD) deaths in India and also remains to be the leading cause of blindness, renal failure, and congestive heart failure.[7,8]

Previously identified risk factors for hypertension in Indians include higher body mass index (BMI), abdominal obesity, greater age, greater alcohol consumption, sedentary lifestyle and stress. All of these risk factors, together with hypertension itself, have been identified as risk factors for both stroke and myocardial infarction worldwide by the Inter-stroke and Inter-heart study teams, and in this respect India appears to be no different to other parts of the world.[7,8] Nevertheless, as rural India continues to undergo demographic transition, the contribution of such risk factors to hypertension in India is likely to change. Studying these changes may give greater insight into how best to allocate resources to reduce the burden of hypertension on India's heath care system.

The rural population in India has difficulty to access quality healthcare. Further, they are not conscious enough to seek healthcare until they are critically ill. Community-based studies are required to highlight the problem of hypertension with the correlates for comprehensive approach. Therefore, this population-based study was undertaken to find out the prevalence and risk factor of hypertension in an adult rural community in rural Raichur.

MATERIALS AND METHODS

The present study was carried out in village Singanodi, which is designated as rural field practice area of Community Medicine Department, Navodaya Medical College. The village has population coverage of 14,200. The study population includes all subjects who were aged 30 years and above. This population serves as denominator to know the prevalence of diabetes. The present study was a population based cross sectional study. We included all subjects who were aged 30yrs and above in the study area. All subjects who were aged below 30 years in the study area were excluded from the study.

The population of sample size aged 30 years and above is 35.8%. The sample size in our study area with a total population of 14200 was estimated to be 5083. In the present study, a total of 643 people were screened, by using a prevalence of 13% and allowable error with 20%.

Sample Size: N = Z2P Q/D2; N = 1.962 X 13 X (100-13)/202; N = 643.

The data was collected by house to house visit, those people who were aged 30 years and above were interviewed using pre designed and pre tested proforma. This was followed by detailed Clinical examination, Anthropometric measurements and investigations. The study was conducted for a study of one year (i.e. from 1st March 2012 to 28th Feb 2013).

After approval by Institutional ethics committee and informed verbal consent data was obtained from all participants by health workers. The health workers informed and motivated the families to participate in the study along with the scope of future intervention, if necessary. All the participants were explained about the purpose of the study and were ensured strict confidentiality. The participants who refused to give consent were excluded from the study. Data regarding family and personal characteristics were recorded by personal interview. The questionnaire used was based on the WHO Stepwise approach to chronic disease risk factor surveillance (STEPS) questionnaire. The questions were explained to participants in their local language. The questionnaire recorded basic demographic information (age, sex, education etc.) for each member of the household. Collecting accurate information on patient age was difficult, since very few people had a birth certificate. Age was calculated from birth year and confirmed using memory prompts, such as historical events, where the year of birth was in doubt. For those aged 15 years and above, information on tobacco use, alcohol intake, diet, history of hypertension, history of diabetes, psychosocial stress and disability was recorded.

By simple random sampling technique, 643 study participants were selected. Body weight was measured (to the nearest 0.50 kg) in the standing motionless on the Bath room scale with feet 15 cm apart, and weight equally distributed on each leg. Height was measured (to the nearest 0.50 cm) by Stadeometer in standing position with closed feet, holding their breath in full inspiration, and Frankfurt line of vision. Blood pressure was measured by auscultation, using the standardized sphygmomanometer. All the participants were requested to take rest for 10 minutes. Blood pressure was measured in sitting position with an appropriate sized cuff encircling the arm. Two separate readings were taken at an interval of minimum 3 minutes. The average of two readings was taken. Recent JNC 7 and WHO classifications were used for classifying the hypertension. On an average, five to six interviews were conducted in a day. Details of the questionnaire can be provided, if required. Information on hypertension was disseminated to the patients and their caregivers in health education sessions to complement the findings of study.

Statistical analysis: The data collected were thoroughly cleaned and entered into MS Excel spreadsheets and analysis was carried out. The statistical analyses were done by using SPSS 20 version software. Proportion of adult person with hypertension was presented as percentage and Chi square tests were used in this study to analyze epidemiological variables. P<0.05 was used as the definition of statistical significance.

RESULTS

Our study included 386 (60.03%) males and 257 (39.97) females [Table 1&2]. 240 (37.3%) were in age group of 30-39 years, 222 (34.5%) were in age group of 40-49 years, 107 (16.6%) were in age group of 50-59 years and 74 (11.5%) subjects were in age group above 60 years, 618 (96.1%) were Hindus and 25 (3.9%) were Muslims, no Christian and other religion subjects were found in our study area. Out of total 643 candidates, 601 (93.5%) were married, and 262 (40.7%) were from nuclear family, 308 (47.9%) were from joint family and 73(11.4%) were from extended family. 326 (50.7%) were illiterate, 128 (19.9%) were educated up to primary level, 96 (14.9%) were educated up to high school, 57(8.9%) were educated up to PUC/Diploma, 34(5.3%) had studied up to graduation and 2(0.3%) were educated at postgraduate level. 18(2.1%), 78(12.1%), 60 (9.3%), 161 (25%), 326 (50.7%) belonging to class I, class II, class III, class IV, class V respectively.

Prevalence of hypertension was found to be 161(25.03%) out of 643 population [Table 3]. This study revealed that hypertension was significantly associated with body mass index, maximum in obese patients when compared to normal and underweight;(p<0.0001);significantly associated with central obesity (p=0.0001;p=0.006) in males and females respectively) [Table 4]. There is significant association between smoking and hypertension; 77(29.9%) 0f smokers had hypertension ,alcohol consumption(p<0.015) which was not statistically significant There is significant association with physical activity that is sedentary people were more prone for getting hypertension when compared to heavy worker, vegetarian or non-vegetarian diet , junk food consumption. However, salt intake > 6 grams/day and family history of hypertension were found to be significantly associated with hypertension. (p=0.009; p=0.003 respectively) [Table 4]. The prevalence of hypertension among subjects on vegetarian diet vs. mixed diet was 23.9% vs. 22.2%, respectively but the difference was not statistically significant. (p= 0.09) [Table 4].

Table 1: Distribution according to age and sex of study subjects (Age in years)

Variables	Male		Female		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
30-39	135	35.0	105	40.9	240	37.3
40-49	139	36.0	83	32.3	222	34.5
50-59	73	18.9	34	13.2	107	16.6
>60	39	10.1	35	13.6	74	11.5
Total	386	100	257	100	643	100

Table 2: Distribution of Population.

Population Profile		Number	Percentage
Religion	Hindu	618	96.1
	Muslim	25	3.9
Marital Status	Married	601	93.5
	Unmarried	21	3.3
	Widow	15	2.3
	Divorce	7	1.1
Type of Family	Nuclear	262	40.7
	Joint	308	47.9
	Extended	73	11.4
Education	Illiterate	326	50.7
	Primary	128	19.9
	High school	96	14.9
	PUC/diploma	57	8.9
	Graduate	34	5.3
	Post graduate	2	0.3
Socioeconomic status	Class I	18	2.8
	Class II	78	12.1
	Class III	60	9.3
	Class IV	161	25.0
	Class V	326	50.7

Table 3: Distribution of the Study population based on BP

Blood Pressure	Number	Percentage
Normotensive	482	74.97
Hypertensive	161	25.03
Total	643	100.0

Table 4: Relationship between risk factors and hypertension.

Variable	Category	Number (%)	HTN (%)	χ2	p-value
Sex	Male	386 (60.03)	123 (32.7)	22.08	0.00
	Female	257(39.97)	38 (15.3)		
Age Group	30 - 39	240 (14.2)	36 (14.7)	43.126	0.000
	40 - 49	222 (16.3)	62 (27.9)		
	50 - 59	107 (18.4)	38(35.1)		
	≥60	74 (24.1)	25 (32.3)		
Literacy	Graduate	36 (5.6)	2 (3.8)	14.17	0.007
	10+2	57 (8.9)	6 (9.8)		
	High School	96 (14.9)	21 (23.2)		
	Primary	128 (19.9)	40 (35.7)		
	Illiterate	326 (50.7)	86 (23.9)		
Physical Activity	Heavy	252 (39.1)	35 (13.7)	15.69	0.000
	Moderate	313 (48.6)	95 (27.8)		
	Sedentary	78 (12.3)	25 (30.9)		
BMI	Normal	400 (62.2)	86 (18.8)	16.067	0.000
	Underweight	85 (13.2)	2 (2.2)		
	Overweight	158 (24.6)	73 (40.5)		
Habits	Smoking	257 (40.2)	77 (29.9)	8.31	0.004
	Alcohol	262 (40.9)	79 (30.1)	5.92	0.015
	Added salt	124 (24.3)	28 (22.6)	.007	0.934
Diet	Vegetarian	146 (22..8)	32 (23.9)	0.067	0.795
	Non-vegetarian	497 (77.2)	110 (22.2)		

DISCUSSION

In our study, prevalence of hypertension shows the submerged portion of the iceberg (25.03%). Our findings are further supported by Gupta[6] in Jaipur, in urban adults in 2002 showed prevalence of hypertension as 36% in men and 37% in women and a study conducted by Vimala et al.[9] in Trivandrum city, Kerala, south India in 2006 which showed the prevalence of hypertension as 47%.

Prevalence of hypertension is an age related phenomenon. In our study, prevalence of hypertension has shown consistent increase with age supported by other studies also. Sharma et al.[10] in their study in suburban area of Nepal found that the prevalence of hypertension increased with age. Das et al.[11] in their study found significant association of hypertension with age. Shah et al.[12] in their study among adults of Pakistan found age to be independently associated with higher prevalence of hypertension. Cappuccino et al.[13] in their study in African population also found that the prevalence of hypertension increased with age.

Our study showed a significant association between HTN and alcohol consumption (p=0.013). A study done by Hazarika et al.[14] in Assam (2003) on elderly population found that Alcohol consumption increased the risk of hypertension in the study population. Reddy et al.[1] in Tirupati in 2005, Patnaik[15] in Orissa in 2005, Chandwani et al.[16] in Gujarat in 2005 also revealed higher prevalence of hypertension among those who consume alcohol. Study conducted by Irfan et al.[17] in Surat found that prevalence of hypertension was higher (40.1%) among alcohol consumer than non- drinker (27.2%).

Study by Saunders et al.[18] found a significant positive association between hypertension and alcohol consumption. In their study, in most cases the BP level fell to normal levels after abstinence and remained so in those who continued to abstain but returned to the hypertensive state in those who resumed consumption of alcohol, thus indicating that alcohol is an important risk factor for hypertension. Like present findings Shanthirani et al.[19] came up with the conclusion that although smoking has positive association with high blood pressure but alcohol consumption did not show significant association with hypertension.

The Chennai urban population study in 2003 showed BMI was more in hypertensives compared to non-hypertensive individuals.[19] A multi-centric study conducted by Hypertension study group in 2001 among the elderly in Bangladesh and India found that High body mass index was an important correlate of

hypertension.[20] Studies done by Zachariah et al.[21], Reddy et al.[1] in Tirupati (2005), Patnaik[15] in Orissa (2005), Yadav et al.[22] (2008) and Chandwani et al.[16] in Gujarat also revealed the similar findings.

Jajoo et al.[23], Malhotra et al.[24], Singh et al.[25], Goel et al.[26], and Joshi et al.[27] also reported that there is increase in risk of hypertension with increase in BMI. Similar finding was noted when nutritional status was decided by using waist-hip ratio. In this study, only 13.2% of the population was overweight and obese (BMI>25.0), 24.0% of the population had waist-hip ratio equal to or more than cut-off (0.9 for males and 0.8 for females). This implies the importance of waist-hip ratio in thin built individuals as central obesity indicated by increased waist-hip ratio has been positively correlated with high blood pressure in several populations. Vaidya A et.al in their study showed age, physical inactivity and obesity as independent risk factors of hypertension which keep up with our study but unlike our study where positive correlation between smoking, alcohol consumption and high blood pressure has been reported their study does not show significant association between use of tobacco and alcohol with hypertension.[28]

This study also found a positive correlation with salt intake, fruits and vegetable intake similar to studies done by Chandwani[16] in Gujarat and Vimala et al.l[9] in urban population of Kerala.

Our results can be compared with a study done by Vimala et al.[9] which showed that the prevalence of hypertension among subjects on vegetarian diet vs. mixed diet was 41% vs. 49%, respectively but the difference was not statistically significant. (p= 0.09). A study done by Gilberts et al.[29] in the south Indian population also did not find significant association between diet and hypertension.

CONCLUSION

Our study has shown a high prevalence, even in rural area. About 30% of study population had never ever had their blood pressure examined and about 40% of the hypertensives were not aware of their status which is worrisome. About 48% of the study population falls under the pre-hypertension category. Without proper knowledge and intervention programs they are at risk of developing hypertension and its complications. The need of the hour is to increase awareness regarding modifiable risk factors of hypertension among the people and our study provides a background for a population-based intervention in attempts to prevent the rising problems of hypertension in the country.

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