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Research Article

Prevalence of hypertension in an urban area: a community-based survey in Trichy, Tamilnadu, India

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ABSTRACT

Background: India is facing an epidemic of non-communicable diseases. Hypertension is now a disease of prime concern due to the mortality and morbidity associated with it. In order to effectively deal with this problem we must first understand the characteristics of this disease. Aims: To assess the prevalence of hypertension in an urban district in Tamilnadu and to study selected risk factors associated with it.
Methods: Community based survey in Trichy district of Tamilnadu. A total of 373 individuals were screened in the field practice area of KAP Viswanatham Government Medical College. A proforma was used to collect demographic characteristics and record findings. Blood pressure was measured; BMI and waist-hip ratio were calculated. Statistical Analysis Used: Data were analyzed using SPSS version 20. Descriptive statistics, Chi-square test and unpaired (two sample) t-test were used to study the variables.
Results: Prevalence of hypertension was found to be 30.56% and prehypertension was found to be 23.32%. 35.9% patients were overweight/ obese. There was no significant difference between the blood pressures of males and females. Persons above 30 years of age had significantly higher systolic ($p<0.001$) and diastolic blood pressures ($p=0.03$) as compared to younger age groups.
Conclusions: The prevalence of hypertension is found to be high. We must implement effective screening programmes so as to initiate treatment in the pre hypertensive stage and reduce the burden of disease. Widespread health education programmes need to be implemented to improve awareness regarding modifiable cardiovascular risk factors.

Keywords: Hypertension, BMI, Waist-hip ratio

INTRODUCTION

Cardiovascular diseases have emerged as an important public health problem in India. Hypertension is a major contributor to the worldwide epidemic of cardiovascular disease.[1] It is estimated that hypertension causes 7.5 million deaths worldwide amounting to 12.8% of the total of all annual deaths.[2,3] Hypertensive heart diseases accounted for 15.3 million DALYs lost (3.8%) and 8.7 million deaths (13.5%) in 2010.[4] The global prevalence of hypertension is currently increasing and is projected to affect in excess of 500 million by 2025.[5] Better control can lead to prevention of 300,000 of the 1.5 million annual deaths from cardiovascular diseases in India.[6] The prevalence of hypertension increases with age in all populations. Hypertension is the most common condition seen in primary care and leads to myocardial infarction, stroke, renal failure, and death if not detected early and treated appropriately.[7] Early detection of hypertension is a major challenge. This is because high blood pressure rarely causes symptoms until organic damage has already occurred. The only effective method of diagnosis of

hypertension is to screen the population. Screening must be linked to follow-up and sustained care. Epidemiological studies demonstrate that prevalence of hypertension is increasing rapidly among Indian urban populations and by the current definitions more than two-fifths of the Indian urban adult population has hypertension. This study is aimed to assess the prevalence of cardiovascular risk factors such as hypertension, overweight/ obesity (Body Mass Index ≥ 25 kg/m^2), central obesity (Waist: Hip Ratio >1.0 for men, >0.85 for women).[8]

METHODS

The present study is a community-based cross-sectional study conducted in the field practice area of KAP Viswanatham Government Medical College, Trichy district in Tamil Nadu state during the year 2013. The study was conducted in Subramaniyapuram, an urban area in Trichy district. By simple random sampling method five sub areas were selected. In each of these sub areas the streets were enlisted. From the list of streets three streets were randomly selected. In each of these streets, every alternate house was selected (systematic random sampling) and visited. In the selected houses all individuals aged ≥16 years were included. Seriously ill patients were excluded from the study. If a house was locked at the time of visit, that house was excluded from the study and the immediate next house was taken for the study. A proforma was utilized for data collection. Information regarding demographic characteristics, family history and past history of hypertension and treatment history were collected. Physical examination was performed to assess height, weight, waist and hip measurements and blood pressure. Body Mass Index (BMI) was calculated as weight (kg) divided by squared height (m). Obesity was defined as BMI ≥25 kg/m^2. Waist-Hip Ratio (WHR) was calculated. Truncal obesity was diagnosed when WHR was >1.0 in males and >0.85 in females. The blood pressure (BP) was recorded in the sitting position in the right arm with a mercury sphygmomanometer. Blood pressure was reported to the nearest 2 mm of mercury column height. Two readings were taken five minutes apart and the mean of the two was recorded as the blood pressure. Hypertension was diagnosed when systolic blood pressure was ≥140 mm Hg and/or diastolic blood pressure ≥90 mm Hg or a person was a previously diagnosed hypertensive. Individuals with a systolic BP of 120 to 139 mm Hg or a diastolic BP of 80 to 89 mm Hg should be considered as pre hypertensives indicative of the need for promoting lifestyle modifications to prevent CVD. Informed written consents were obtained from each participant before clinical examination. Health education was administered to each participant. All newly detected hypertensive subjects and those with cardiovascular risk factors were referred to the urban health centre at Subramanyapuram for further evaluation and treatment.

Statistical analysis

The continuous variables have been reported as mean (SD). The prevalence rates have been reported as percentages. Age-stratified distribution of blood pressure levels and prevalence rates are reported. Chi square test was used to test differences in proportions. T test was used to compare means.

RESULTS

Of a total of 373 subjects studied 277 (74.3%) were females. The mean age of the subjects was 46.27 (15.63) years and the majority (33.6%) of subjects were in the age group of 30-45 years.

Table 1: Age and sex wise prevalence of pre-hypertension.

Age group (in years)	Gender	
	Male (n=24)	**Female(n=63)**
16-30 years	12.5	14.3
31-45 years	33.3	27.0
46-60 years	8.3	30.2
> 60 years	45.9	28.5
Total	100.0%	100.0%

Prevalence of prehypertension was found to be 23.32%. The prevalence was found to be high in the age group of > 60 years among males and 46-60 years among females (Table 1).

The overall prevalence of hypertension was found to be 30.56%. Of these 23.36% (n=87) patients were newly diagnosed and 7.2% (n=27) were known hypertensives on treatment. Among hypertensives, the proportion was found to be higher among females (69.0%). In males the prevalence was high (42.3%) among those > 60 years of age while in females those in the age group of 46-60 years were most affected (42.3%) (Figure 1).

The mean values of systolic blood pressure among males was found to be 137.09 (16.92) mm Hg and in females it was found to be 139.64 (16.11) mm Hg. For diastolic blood pressure the mean value for males was 89.94 (10.87) mm Hg and females had a mean value of 90.44 (11.35) mm Hg. There was no significant difference between the blood pressures among males and females. (t= 0.76 for systolic BP and t= 0.22 for diastolic BP)

Prevalence of prehypertension was found to be 23.32%. The prevalence was found to be high in the age group of > 60 years among males and 46-60 years among females (Table 1).

From this study it is evident that persons above 30 years of age have significantly higher systolic ($p<0.001$) and diastolic blood pressures ($p=0.03$) as compared to those below 30 years of age (Table 2). The present study found

that 134 (35.9%) patients were overweight and obese. More females were overweight/obese as compared to males (44.3%).

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Table 2: Association between age and blood pressure.

Age Category	SBP (mm Hg)		P value	DBP (mm Hg)		P value
	≥ 140 N (%)	< 140 N (%)		≥ 90 N (%)	< 90 N (%)	
< 30 yrs	2 (3.0)	65 (97.0)	<0.001*	9 (13.4)	58 (86.6)	0.039*
≥ 30 yrs	65 (21.2)	241 (78.8)		77 (25.2)	229 (74.8)	
Total	67 (18.0)	306 (82.0)	373 (100.0)	86 (23.1)	287 (76.9)	373 (100.0)

*Chi square test.

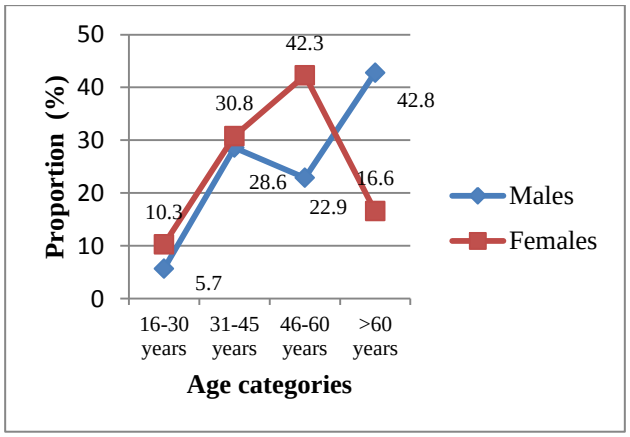

Figure 1: Age and sex wise prevalence of hypertension.

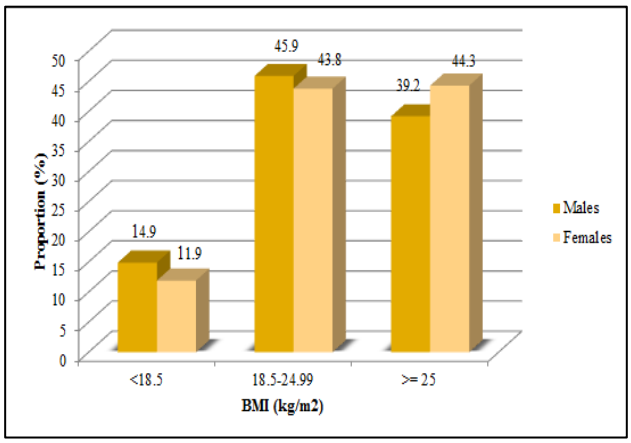

Figure 2: Sex-wise classification of BMI.

The present study found that 134 (35.9%) patients were overweight and obese. More females were overweight/obese as compared to males (44.3%)

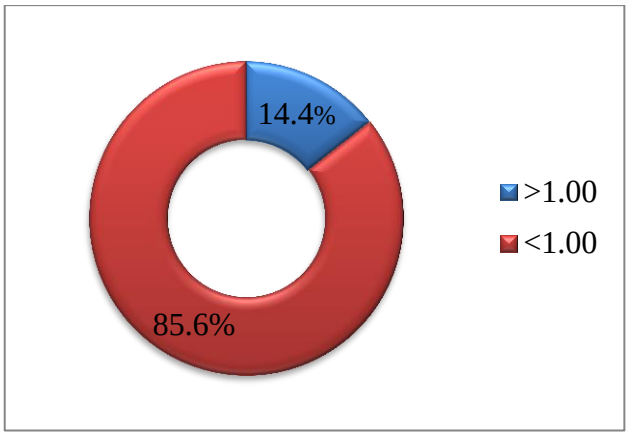

Figure 3(a): Males- Waist-hip ratio.

Majority of the males (85.6%) had a normal waist hip ratio while majority of the females (52%) had an above normal waist-hip ratio (Figure 3a and 3b).

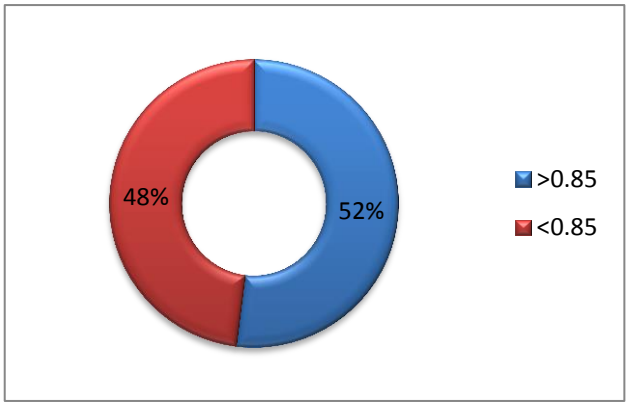

Figure 3(b): Females - Waist-hip ratio.

Majority of the males (85.6%) had a normal waist hip ratio while majority of the females (52%) had an above normal waist-hip ratio (Figure 3a and 3b).

From this study it is evident that persons above 30 years of age have significantly higher systolic ($p<0.001$) and diastolic blood pressures ($p=0.03$) as compared to those below 30 years of age (Table 2).

DISCUSSION

Hypertension is now an epidemic with developing countries being heavily burdened. Over the last 20 years various studies have shown that people in economically developing countries are increasingly having high blood pressure levels with a high prevalence of hypertension.[9]

Prehypertension leads to an increased risk of CVD and end-stage renal disease. It is associated with an increased CVD mortality, especially from stroke. Prehypertension is now recognized as an important candidate for cardiovascular intervention and risk reduction.[10]

Numerous studies have been undertaken to assess the prevalence of hypertension. This study has assessed the prevalence of hypertension and also looks at the age profile of hypertensives and how blood pressure differs between the sexes.

Our study in an urban setting in a district of south India found the prevalence of hypertension to be high. This is comparable to a meta analytical review of prevalence of hypertension by Raghupathy Anchala et al where the prevalence was found to be 31.8% for urban south India. The burden of hypertension appears to range between 5-35%, in different countries of Asia.[11,12] In a STEPS survey conducted in Bangladesh in 2010 the prevalence of hypertension was found to be 21%.[13]

The mean systolic and diastolic blood pressures were found to be in pre hypertensive range for both males and females in our study population. However there was no significant difference in the blood pressures among them. Momin MH, et al., found that prevalence of hypertension was significantly higher among men (32.5%) as compared to women (23.1%).[14] But however, another study by Lloyd-Sherlock, P., et al., in India it was found that there is no gender difference (Male:51.1%; Female:48.9%).[15] Hypertension was prevalent among 35% males and 33% females.[16]

Among the hypertensives, a higher proportion of females were affected. From this study it is evident that females in the fifth and sixth decades of life are most affected. While among males, the geriatric age group was most affected. As compared to males, the prevalence of hypertension is higher in females for all the age categories except in the elder age group. Other studies such as by Das SK et al., have found that as the age increases the prevalence of hypertension also increases.[17]

A study by Momin, M. H. et al., among 1493 employees, found that prevalence was high among persons with age 50 years and above (48.5%) and also among males (32.5%) as compared to females (23.1%).[14]

The distribution of pre hypertension in our study population was found to be similar to that of hypertension. The overall prevalence remained high with females in the 45 to 60 year age group and males > 60 years being most affected. In a study among bank employees, the prevalence of hypertension was 30.4% and pre-hypertension was 34.5%. 56.70% were not having any symptoms at the time of examination.[18]

Obesity has been consistently linked to adverse cardiovascular outcomes over the years. On assessing BMI we found one third of our study population to be overweight and obese. This is much higher than the observation by Zaman, M. M., et al. in their study which found 17% of adults to be obese.[13] A multicentric study in India by Joshi, S. R., at al(19)., Central obesity was prevalent among 32.8% males and 56.1% females and 115 (10.9%) had body mass index ≥ 27.5 kg/m^2.

Waist-hip ratio, an important indicator of central obesity was found to be normal in majority of the males in our study population. However 52% females had a waist-hip ratio above the accepted cut off of 0.85.

CONCLUSION

A high prevalence of pre-hypertension and hypertension were found in our study. Our study has also shed light on the presence of hypertension among young adults i.e. persons below 30 years of age. It thus pertinent to introduce into the community, large scale screening programmes to identify hypertensives and pre hypertensives. We are presented with an excellent opportunity to put in place primordial prevention by promoting health education among the youth regarding favourable eating habits, physical exercise, weight reduction, etc. furthermore, to ensure good continuance of such practices, the voluntary health worker/ ASHA in each region can be trained to measure blood pressure and deliver health education at regular intervals. ASHAs can play a vital role in identifying important risk factors for CVD and stroke at the earliest.

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