A Study on Prevalence of Pre - Hypertension among Adult population in a Rural area of Kancheepuram district, Tamil Nadu, India.

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ABSTRACT

To study the prevalence of pre-hypertension and the modifiable risk factors such as increased BMI and increased weight circumference that are associated risk factors of pre – hypertension among adult population in rural Sripuram area of Kancheepuram district. A descriptive cross – sectional study involving 302 adults residing in Sripuram rural area. A structured peer reviewed questionnaire was used to collect data regarding demographic characteristics and blood pressure measurement along with BMI and waist circumference. The frequencies were calculated for all the parameters and prevalence of pre hypertension was expressed in percentage with 95% confidence limits using SPSS (version 15) software. The prevalence of pre – hypertension and hypertension among adults was found to be 26.8% and 11.3% respectively .The prevalence of adults having an increased BMI (overweight, obese, very obese) was 33.8% and increased waist circumference was found to be 11.6%.The prevalence of pre – hypertension among adults in Sripuram rural area was found to be high. Early detection of pre – hypertension by periodic screening is essential and counselling on healthy lifestyle modification by health care professionals will prevent progression of pre-hypertension to hypertension and further cardiovascular complications.
Keywords: Body mass index, Cardiovascular diseases, Pre – hypertension, Lifestyle Modification, Waist circumference

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INTRODUCTION

One of the most common non communicable disease and asymptomatic condition is hypertension. It poses a threat to the human population worldwide due to its complications like coronary artery disease, stroke, myocardial infarction and other vascular complications. It is one of the major risk factors for cardiovascular mortality, which accounts to 20-50 per cent of all deaths [1]. The baseline studies carried out in 4 selected districts by Tamil Nadu health systems project in 2006 shows the prevalence of hypertension to be 26.9% among the rural population[2]. Persons with blood pressure above optimal levels, but not clinical hypertension (systolic blood pressure of 120-139 mm Hg or diastolic blood pressure of 80-89 mm Hg), are defined as having "prehypertension"[3]. Pre - hypertension is a precursor of hypertension associated with increased risk of major cardiovascular events independent of other cardiovascular risk factors [4]. Detection of pre - hypertensives and counselling them on healthy lifestyle modification (LSM) has a vital role in preventing them from becoming an hypertensive and get affected by cardiovascular diseases CVD .The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of High BP (JNC-7)[5] provides the classification of blood pressure for adults aged 18 and older. According to JNC-7,the classification for blood pressure is as given below.

Blood pressure classification	SBP (mmhg)	DBP (mmhg)
Normal	<120	<80
Pre hypertension	120 – 139	80 - 89
Stage I Hypertension	140 – 159	90 - 99
Stage II Hypertension	>=160	>=100

The classification of pre hypertension signals the need for increased education of health care professionals and the public to reduce high BP levels and prevent the development of hypertension in the general population. The LSM strategies available to lower pre – hypertension to normal level is as similar as that of lowering hypertension such as weight reduction in those individuals who are overweight or obese, adoption of the Dietary Approaches to Stop Hypertension (DASH)[6] eating plan which is rich in potassium and calcium, dietary sodium reduction, physical activity, and moderation of alcohol consumption.

This study was conducted to study the prevalence of pre-hypertension and its modifiable risk factors like increased waist circumference and body mass index. The purpose of this study is to emphasise on the non pharmacologic therapy that is required at this level. This can be provided through proper health education by health staff on healthy lifestyle modification to prevent the adults to progress from pre-hypertension to hypertension.

Objectives

- To study the prevalence of pre – hypertension among the adult population in Sripuram rural area of Kancheepuram district.
- To study the prevalence of modifiable risk factors such as increased BMI and increased weight circumference that are associated risk factors of pre – hypertension.

METHODOLOGY

The study is descriptive cross sectional study conducted in Sripuram, the rural field practice area of our medical college in Kancheepuram district. The study was carried out from January to June 2015. Based on a study done by Essam et al in the rural adult population in Bareilly on pre hypertension[10], the prevalence rate of 27% was taken for calculating the sample size. The sample size was arrived at 302, considering 5% allowable error at 95% confidence limits.

Inclusion criteria

All individuals aged at and above 18 years residing in the area situated near the Rural Health Training Centre of the department of Community Medicine, Sri Balaji medical college and hospital, Chrompet.

Exclusion criteria

The individuals who did not give consent for the study were excluded. The individuals who gave a history of being a known hypertensive and under anti-hypertensive drugs were excluded.

The list of adult population (18 years and above) residing in Sripuram area for the last one year was obtained from the rural health training centre. The participants were selected by simple random sampling using computer generated random numbers. A structured peer reviewed questionnaire was used to collect data regarding the age, gender, height, weight, BMI, waist circumference and blood pressure measurement. Informed consent was obtained from all participants.

The height was measured in centimetres using a stadiometer, weight in kilograms using a calibrated weighing machine and BMI was calculated using Quetelet's index (weight in kg/height 2 m)[1]. The reference value was taken as per the classification of weight in adult Asians from the Asia pacific perspective[6] . The waist circumference was measured using an inch tape at the level of midpoint between the lower border of the rib cage and iliac crest[1].The reference value is >=88 for females and >= 102 for males which is considered as increased risk for metabolic complications [1]. The blood pressure was measured using a mercury sphygmomanometer after the patient was made to sit in a chair in a comfortable position quietly for atleast 5 minutes with the arm to be measured supported at heart level. Two BP measurements were taken and the mean of the same was taken for the analysis.

Data was entered in Microsoft excel sheet and exported to Statistical Package for Social Science (SPSS) windows version 15.0 software for analysis purpose. The frequencies were calculated for all the parameters and prevalence of pre hypertension was expressed in percentage with 95% confidence limits.

RESULTS

Table 1: Background characteristics

| S.no	Parameters	Frequency	Percentage %
1	**Age in years**		
	< 35	42	13.9
	36 - 50	104	34.5
	51 - 75	152	50.3
	>75	4	1.3
2	**Sex**		
	Males	119	39.4
	Females	183	60.6
3	**Waist circumference**		
	Increased	35	11.6
	Normal	267	88.4
4	**Body Mass Index**		
	<18.5 – underweight	72	23.8
	18.51 – 22.9 - normal	127	42.2
	23 – 24.9 - overweight	43	14.3
	25 – 29.9 - obese	44	14.7
	>30 – very obese	15	5

Among the 302 adults examined in this study majority (50.3%) of the respondents were aged between 51 to 75 years. 34.4 % of the adult population belonged to the age group of 36 to 50.The adults in the age group of less than 35 years was found to be 13.9% and above 75 years was 1.3%.The mean age is found to be 51.7.

Among the 302 adults, majority (60.6%) of them were females and around 39.4% were males. Among the adults examined in this study, 11.6% of both males and females were found to have increased waist circumference .88.4% of males and females were found have normal waist circumference .The mean waist circumference is 79.6.

Among the study participants majority (42.1%) of the adults were found to have normal BMI (18.51 – 22.9). 5 % were found to be very obese (BMI - >30). Around 14.7% were found to be obese (BMI – 25 to 29.9).14.3% were found to be overweight and around 23.8% were found to be underweight (BMI - <18.5).The mean BMI is 21.8.

Table 2: Prevalence of Pre-hypertension classified as per JNC 7

S.No	Characteristic	Frequency	Percentage %	95% Confidence Interval
1	Normal	161	53.3	47.7 – 58.9
2	Pre-hypertension	81	26.8	21.9 – 31.7
3	Stage 1 HTN	34	11.3	7.8 – 14.8
4	Stage 2 HTN	26	8.6	5.5 – 11.7
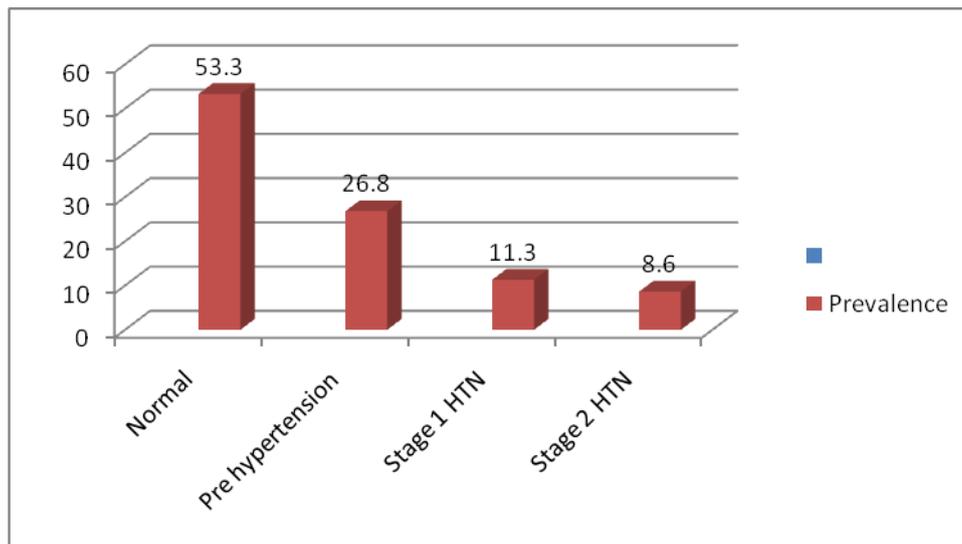
Figure 1: Prevalence of pre hypertension classified as per JNC.

Among 302 study participants, 53.3% were found to be normotensives. Around 26.8% were found to be pre – hypertensives. 11.3% of adults were found to have stage I hypertension and 8.6% were found to have stage II hypertension (Fig1). The mean systolic BP is 115 and diastolic BP is 75.The 95% confidence interval for pre – hypertension is 21.9 – 31.7.

DISCUSSION

People diagnosed as pre – hypertensives have an increased risk of developing hypertension than the normotensives[7]. In this study the prevalence of pre hypertension and hypertension among the adults in a rural area is 26.8% and 11.3%. The prevalence of increased BMI (overweight, obese, very obese) among the adults is 33.8% and the prevalence of adults having an increased waist circumference is 11.6%. BMI is a strong predictor of pre hypertension [7]. Waist circumference is an approximate index of intra-abdominal fat mass and total body fat [8]. Changes in waist circumference reflect changes in risk factors for CVD and other chronic diseases [1]. Family history of hypertension, sedentary lifestyle ,unhealthy food habits, eating high sodium foods, smoking, excessive alcohol intake ,physical inactivity are other risk factors[6]. Pre – hypertension is often asymptomatic at the time of diagnosis and hence blood pressure above normal can go undiagnosed for a long period of time.

Such similar prevalence of pre-hypertension (24.5%) has been reported in the study by Bhardwaj et al (2010) carried in a rural adult population in Himachal Pradesh [9]. Another study by Essam et al in the rural adult population in Bareilly reported the prevalence of pre – hypertension to be 27.2% [10]. A study by Srinivas et al in rural areas of adult population in Andhra Pradesh the prevalence of pre - hypertension was reported as 30.1% [11].

This study reports the high prevalence of pre hypertension and its associated modifiable risk factors liked increased BMI and waist circumference which makes an individual more susceptible to hypertension and other cardiovascular diseases. Hence prompt intervention by non pharmacologic therapy – healthy lifestyle modification[7] should be emphasised by health care professionals to the adult population under risk.

CONCLUSION

This study makes us recognise that early detection of pre – hypertension can be done by screening services and the need for the prompt intervention at the right time through necessary healthy lifestyle modification so that an individual with pre hypertension can be prevented from becoming an hypertensive and complications of it that would affect the eye, heart, blood vessels and kidney in the future. As our country is moving towards rapid urbanisation, it is vital for the health care professionals to realise the importance of healthy lifestyle modification. Hence, more emphasis should be laid on imparting proper health education to the adult population.

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