

A Study of Hypertensive Risk Factors among Young Adult Males in Western Uttar Pradesh.

Anil Kumar Sharma¹, Bhawani Shankar Modi², Shikha Sharma³

¹Associate Professor, Dept. General Medicine Dept. FH Medical College, Tundla, Dist. Firozabaad.

²Demonstrator, Dept. Anatomy Dept. FH Medical College, Tundla, Dist. Firozabaad.

³Professor, Dept. Anatomy Dept. FH Medical College, Tundla, Dist. Firozabaad.

Received: August 2016

Accepted: September 2016

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ABSTRACT

Background: Hypertension has been identified as the leading risk factor for mortality. Therefore, the present study has been taken up to find out the relation between anthropometric indices, blood pressure and hypertension so as to identify the population under risk. **Methods:** The present study was done on 600 male students of age group 16-27 years belonging to FH Medical College, Tundla, Firozabad and St. Andrew's college, Agra. The anthropometric measurements of the subjects were taken with the slandered instruments with standard techniques described as Height (mt), Weight (Kg), Waist Circumferences (cm), Hip Circumference (cm), Pulse rate Radial pulse felt and counted at wrist for 1 minute. **Results:** In the present study 43% students were found under low level of stress and more levels of stress were seen in 6%. The prevalence of pre-hypertension was found 69% while hypertension was found 5.75%. **Conclusion:** Strong association of faulty dietary history, sedentary life style and genetic history was seen with blood pressure.

Keywords: Hypertension, Cardiovascular disease, Obesity.

INTRODUCTION

Hypertension is an important worldwide public-health challenge because of its high frequency and concomitant risks of cardiovascular and kidney disease. It has been identified as the leading risk factor for mortality and to pool data from population-based studies in different regions to estimate the overall prevalence and absolute burden of hypertension in the whole world and in various regions in 2000, and to estimate the global burden in 2025.^[1-3]

Name & Address of Corresponding Author

Dr. Anil Kumar Sharma
Associate Professor,
Dept of General Medicine,
FH Medical College,
Tundla, Dist Firozabaad 283204, India.

Stress has been implicated as a risk factor for blood pressure and cardiovascular disease and may contribute to changes in dietary behaviours that lead to weight change. Different anthropometric measurements such as body mass index (BMI), waist to hip ratio (WHR), waist and hip circumferences (WC and HC) and skin fold thickness are the important indicator to investigate the risk factors for cardiovascular diseases.^[16] The study was done by Van der sande et al on West African adults. It was observed that a family history of hypertension,

obesity, diabetes and stroke was a significant risk factor for obesity and hyperlipidaemia. More pathological manifestations can develop in the high-risk group with increase of age. The study suggested that health professionals should utilize every opportunity to include direct family members in health education.^[17]

Cardiovascular diseases caused 2.3 million deaths in India in the year 1990; this is projected to be double by the year 2020. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. There is a strong correlation between changing lifestyle factors and increase in hypertension in India.^[14]

Hypertension is an important public-health challenge worldwide. It is present in 25% urban and 10% rural subjects in India. A high prevalence of pre-hypertension and hypertension were noted in affluent urban north Indians. Increasing age, body mass index, central obesity and impaired glucose tolerance are significantly associated with both hypertension and pre-hypertension. Pre-hypertension is associated with an increased prevalence of cardiovascular risk factors and the number of adults with hypertension in 2025 is predicted to increase by about 60% in economically developing countries.^[3,15]

Anthropometry has been an important tool for identify risk of many diseases. It has gained more importance due to high rise in life style related

disorders. Various anthropometric indices like BMI, WHR, WHtR have been found to be predictors for many diseases like hypertension (HTN), diabetes, coronary artery diseases (CAD) in various populations. A number of environmental and genetic factors are associated with hypertension such as age, sex, body size, obesity, change in dietary habits and family history of hypertension, physical activity, increased stress.^[1]

There is a strong linear relationship between high blood pressure (BP) levels and the risk of CVD. Though the terminology “prehypertension” (systolic blood pressure 120-139 mm Hg and/ or diastolic blood pressure 80-89 mm Hg) is known for many years, its global awareness increased tremendously after the JNC (Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure)-7 report from the United States in 2003.^[2]

The relationships between the BMI and morbidity and mortality risks may also be modified by behavioural patterns, such as smoking, alcohol consumption, and engagement in physical activity or exercise. Regular physical exercise have lower risks of hypertension, cardiovascular disease and overall mortality, while smokers face higher risks for these outcomes.^[12] Stress in numerous contexts may affect the risk for obesity through bio-behavioural processes. Acute stress associated with diet and physical activity.^[13]

Therefore, the present study has been taken up to find out the relation between anthropometric indices, blood pressure and hypertension so as to identify the population under risk. The data can be helpful in applying preventive strategies for hypertension at an early stage.

Aims of Present Study:

To correlate anthropometric indices and environmental risk factor for hypertension with blood pressure and to find out prevalence of hypertension and environmental risk factor for hypertension in young adult males students belong to Firozabad & Agra.

MATERIALS AND METHODS

The present study was done on 600 male students of age group 16-27 years belonging to FH Medical College, Tundla, Firozabad and St. Andrew's college, Agra. The subjects already diagnosed having heart disease, chronic diseases of major organ and endocrine disorder. Proper history of subjects were taken with special references to Blood Pressure, Pulse/min, Stress level (based on questionnaire), family history (of HTN, Coronary artery disease, diabetes and stroke) was taken.

The anthropometric measurements of the subjects were taken with the standard instruments with standard techniques described as Height (mt),

Weight (Kg), Waist Circumferences (cm), Hip Circumference (cm), Pulse rate Radial pulse felt and counted at wrist for 1 minute. Blood Pressure (mmHg) two readings were taken 5 minute apart and if blood pressure was higher another reading taken half an hour apart and the average of three readings taken as blood pressure.^[7]

Normal : Systolic and diastolic < 120/80

Prehypertensives : Systolic 120-139 or diastolic 80-89 mm of Hg

Stage-I Hypertensives: Systolic 140-159 or diastolic 90-99 mm of Hg

After taking all parameters, following indices were calculated:

Body mass index (BMI)^[8,9] : Weight(Kg)/ Height (m²)

a. Normal- 18.50 – 22.99 kg/m²

b. Over weight- 23.00 – 24.99 kg/m²

c. Obesity- \geq 25.00 kg/m²

Waist Hip Ratio (WHR)^[9] : Waist circumference (cm)/ hip Circumference (cm)

a. Normal - <0.89 cm

b. High WHR - \geq 0.89 cm

Waist-Height Ratio (WHtR)^[19]: Waist circumference (cm)/ Height (m)

a. Normal - < 0.5

b. High - \geq 0.5

The measurements were statistically analyzed (arithmetic mean and standard deviation were calculated) and tabulated. The systolic and diastolic blood pressure and environmental risk factor for hypertension were plotted against body mass index (BMI), Waist Hip Ratio (WHR), Waist- Height Ratio (WHtR) and Waist circumference (WC) to find out correlation and significance.

RESULTS

Present study was done in 600 young adult male students aged between 16-27 years. Results of the present study are presented in graphic forms in the following pages.

The most derangement was found in body mass index 45.5% followed by waist circumference 31%. [Figure 1.1]

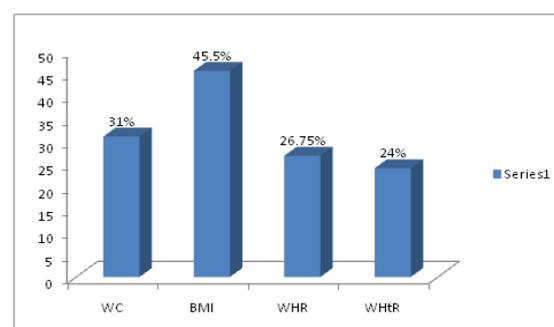


Figure 1.1: Prevalence of Deranged Anthropometric Indices in Study Population.

In the present study 43% students were found under low level of stress and more levels of stress were seen in 6% [Figure 1.2].

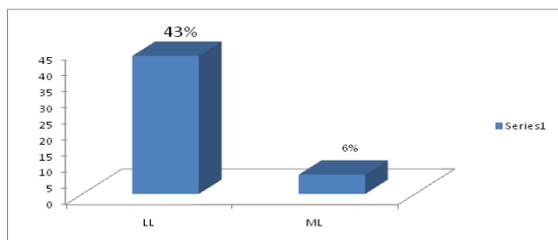


Figure 1.2: Levels of Stress In Study Population.

The prevalence of pre-hypertension was found 69% while hypertension was found 5.75% [Figure 1.3].

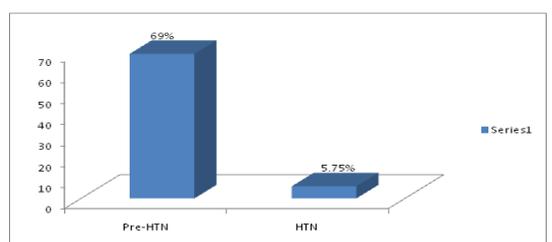


Figure 1.3: Prevalence of Prehypertension and Hypertension in study Population.

On correlating deranged waist circumference with blood pressure, more number of students were found in pre-hypertensive stage [Figure 1.4].

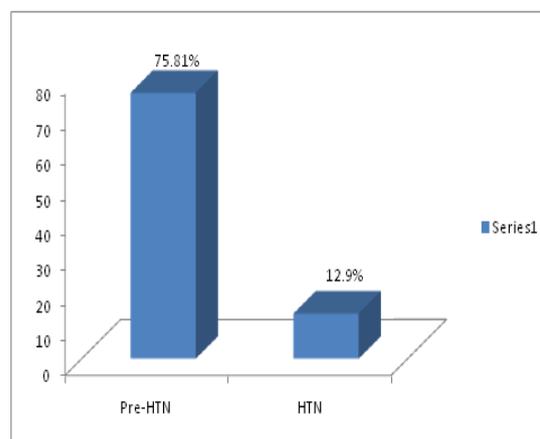


Figure 1.4: Correlation of High Waist Circumference with Blood Pressure in Study Population.

Table 2.1: Comparison of blood pressure of present study with other studies.

Study	Population	Age	Subjects	SBP (mean±SD)	p Value	DBP (mean±SD)	p Value
Al-Ajlan AR ^[6] 2011	Saudi Arabia	18-35	333	113.6±6.04	0.0001**	74.9±5.55	0.0001**
Mahmmod et al ^[5] 2011	Bareilly (Labour population)	18+	185	120.53±13.4	0.0002**	78.75±8.64	0.001**
Mahmood et al ^[4] 2012	Bareilly (Rural Areas)	15+	504	128.12±20.8	0.0007**	76.98±10.97	0.0001**
Deshmukh et al ^[19] 2006	Wardha	18+	1059	120.2±17.6	0.0001**	77.7±12.4	0.0001**
Present Study	West UP	16-27	600	124.25±9.99		81.30±7.71	

DISCUSSION

Cardiovascular diseases (CVD) continue to be the major cause of mortality representing about 30 per cent of all deaths worldwide. Lifestyle diseases like hypertension, diabetes mellitus and overweight /obesity are the major risk factors for development of CVD. With rapid economic development and increasing westernization of lifestyle in the past few decades prevalence of these diseases has reached alarming proportions among Indians in recent years.^[2]

In present study, the prevalence of pre-hypertension was 69% while that of hypertension was 5.75%. Pre-hypertension and hypertension were more prevalent in professional students. Prevalence of hypertension in India is reported as ranging from 10% to 30.9% while average prevalence is 25% in urban and 10% in rural population.^[10] However, there is no such overall prevalence for pre-hypertension available.

[Table 2.1] showed that average SBP of the present study was significantly ($p < 0.001$) higher than the SBP of study done by Mahmood et al^[5], Deshmukh et al^[19] and Al-Ajlan^[6]. On the other hand, in the present study, average SBP was significantly lower than the study done by Mahmood et al^[4] on rural population. The difference may be due to that study done by Mahmood et al^[5] was on labour population, which belongs to low socioeconomic strata. On comparing DBP, it was significantly higher than the previous studies.^[4-6,19]

Stress was prevalent in 49% of study population in the present study. More number (43%) of students had low level of stress although medium levels of stress were found to be higher among professional students. However the difference was not significant. Medium level of stress has been reported among university of Jordan^[11], while a study from Pakistan has reported 71.6% medical students having moderate stress. The high prevalence of stress

among Pakistani students is due to the fact that stress level has been measured just one month before examinations. While in the present study, students were asked to fill stress questionnaire in the beginning of their academic year or during vacation.^[22]

[Table 2.2] depicts that on comparing BMI of present study with previous study, it was found that mean BMI was significantly less in present study than previous studies done on population Saudi Arabia, Indians (Mumbai region) and Population of Delhi. In the present study mean height was (174±0.07) and mean weight was (69.46±12.78). On the other hand the study group in Saudi population was mostly from higher socioeconomic strata. These changes are characterized by a decrease in consumption of green products, vegetables and legumes, together with an increase in the increase in the consumption of meat, potato, fat and daily products.^[20,21]

The significant difference of Delhi population with present study was may be due to no. of cases. Which

were more in previous study. The upper age limit for study population by Prabhakaran et al^[18] and Patil et al^[8] is very large. The mean BMI, WC and WHR of present study was significantly higher than the wardha population.^[19] This may be due to no. of cases which were more in study of Wardha. Similarly in the present study WC and WHR were also significantly less than the previous studies.^[6,18,19,8] This may be due to altered dietary habits in previous studies. In the study done in Delhi, only 5.5% subjects of 18-25 years age group and most of the study population was above 40 years. The most of the individuals had high waist circumference (> 102cm) and represented with central obesity. The genetically susceptible population with high waist circumference had higher prevalence of metabolic syndrome. The industrial population of Delhi was different from the population of present study in terms of its socioeconomic profile.^[18]

Table 2.2: Comparisons of anthropometric indices of present study with other studies.

Study	Population	Age	Subject	BMI mean±SD	WC mean±SD	WHR mean±SD	WHtRmean±SD
Present Study	West UP	16-27	600	22.8±3.73	80.8±9.2	0.86±0.05	0.46±0.05
Deshmukh et al ^[19] 2006	Wardha	18+	1059	19.1±4.23**	72.5±13.7**	0.84±0.09**	0.44±0.07**
Patil SP et al ^[8] 2012	Navi Mumbai	18-65	111	23.48±2.7**	94.57±9.6 **	0.96±0.05**	NA
Prabhakaran D et al ^[18] 2005	Delhi	20-59	2122	23.7±3.4 **	87.6±10.3 **	0.97±0.06**	NA

Strong association of genetic history, dietary history and sedentary life style was seen on pre hypertension in the study population. Blood pressure is positively correlated with all anthropometry indices. It was also found that derangement of anthropometric parameters were significantly higher among students with higher blood pressure (pre hypertensive and hypertensive) in comparison to normotensive students.

CONCLUSION

Hypertension is an important worldwide public health challenge because of its high frequency and concomitant risks of cardiovascular. Various anthropometric indices like BMI, WHR, and WHtR have been found to be predictors for many diseases like hypertension (HTN), diabetes, coronary artery diseases (CAD) in various populations. Technological advances have shrunken employment opportunities particularly among young Indians adding stress caused by strong competition for employment.

The present study was done on 600 male students of age group 16-27 years. The measurements adopted according to anthropometric standards were height, weight, waist circumference, hip circumference,

blood pressure and used to calculate indices like body mass index, waist hip ratio and waist height ratio. Subjects were classified as according to indices and blood pressure as per latest guideline.

WC, BMI, WHR and WHtR were deranged in 31%, 45.5%, 26.75% and 24% subjects respectively. Prevalence of pre hypertension was 69% and hypertension 5.75%. Students with the low levels and medium levels of stress were 43% and 6% respectively. Strong association of faulty dietary history, sedentary life style and genetic history was seen with blood pressure. Significantly higher salt intake in diet was associated with high blood pressure in professional students. High BMI was found to be stronger predictor of pre hypertension in study students.

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How to cite this article: Sharma AK, Modi BS, Sharma S. A Study of Hypertensive Risk Factors among Young Adult Males in Western Uttar Pradesh. *Ann. Int. Med. Den. Res.* 2016; 2(6):ME18-ME22.

Source of Support: Nil, **Conflict of Interest:** None declared