Original Research Article

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A cross-sectional study on prevalence of hypertension among college going degree students in urban Khammam, Telangana

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ABSTRACT

Background: Hypertension is important cause for globally contributing more than 40% to cardiac related deaths worldwide. The increase of hypertension in the developing countries may be connected with the economic transition. The primary aim of this study was to determine the prevalence of hypertension among young adults such as college going degree students in urban Khammam, Telangana, India in relation to the socio-demographic variables associated with hypertension including age, sex, socio-economic status, body mass index, dietary habits, tobacco use and alcohol consumption.

Methods: This study was a cross-sectional was conducted to determine the prevalence and pattern of hypertension among 625 college going degree students in urban Khammam, Telangana, area.

Results: 625 students participated out of which 51.52% were males and 48.48% were females. The prevalence among males was higher as compared to females and found to be statistically significant (p<0.001). In the present study, associated factors like gender, age, marital status, occupation, education status, tobacco use, and physical activity were significantly associated with the hypertension status of the study subjects.

Conclusions: This study establishes the prevalence of hypertension among males was higher compared to females. The socio-demographic variables such as dietary habits, BMI, alcohol and tobacco consumption play a pivotal role in the prevalence of hypertension.

Keywords: Age, Alcohol, BMI, Hypertension, Obesity

INTRODUCTION

Hypertension (HTN) still remains one of the five leading cause of mortality globally, and is one of the leading preventable disease and also one of the important risk factors of cardiovascular disease with more than 40% of deaths. Globally, Cardio-vascular diseases (CVDs) accounts for approximately 17 million deaths a year, nearly one third of the total. Of these, complications of HTN account for 9.4 million deaths worldwide every year. Hypertension is reported for its clinical significance mainly on age dependent. As the age was advancing so did the prevalence of hypertension among both the sexes. In adults especially over age of 50 years, SBP>140

mmHg predicts mortality regardless of diastolic readings but under the age of 50, diastolic blood pressure (DBP) is a better predictor of mortality than systolic readings. If there is a disparity in category between the systolic and diastolic blood pressures, the higher value determines the severity of the HTN.²

Raised blood pressure is a major risk factor for chronic heart disease, stroke, and coronary heart disease. Elevated BP is positively correlated to the risk of stroke and coronary heart disease. Other than coronary heart disease and stroke, its complications include heart failure, peripheral vascular disease, renal impairment, retinal hemorrhage, and visual impairment.³

Several clinical conditions remain challenging in overcoming the burden of hypertension. First, the initial development of hypertension which can be diagnosed immediately can able to protect the end-organ damage remains a greatest challenge. Secondly, the treatment targets recommended by guidelines is been failed due to many patients diagnosed with hypertension fail to continue the complete antihypertensive therapies long term. Third, even among patients who receive appropriate care, a proportion of patients remain resistant to treatment despite multiple medications. These patients with resistant hypertension carry substantial risk of adverse events⁴. The emergence of renal artery de-innervation may herald a novel and effective procedural option to treat these patients.⁵

In Asian urban adult populations, the prevalence of hypertension has shown an upward trend, at present varying between 15-35 percent, with hypertension and stroke occurring at a relatively younger age.⁶ Young adults have been deemed to be at lower risk in their development of hypertension. Most of the literature available on hypertension typically target older adults and the elderly. The prevalence of hypertension among younger individuals, however, is on a steady rise. This may be attributed to several factors such as dramatic changes in lifestyle, stress patterns and improved detection rates due to better screening.⁷

The primary aim of this study was to determine the prevalence of hypertension among young adults such as college going degree students in urban Khammam, Telangana, India in relation to the socio-demographic variables associated with hypertension including age, sex, socio-economic status, body mass index, dietary habits, tobacco use and alcohol consumption.

METHODS

This study was a cross-sectional was conducted to determine the prevalence and pattern of hypertension among 625 College going Degree students in Urban Khammam, Telangana, Area. This study was conducted from 1st August 2019 to January 31st 2020. Permission to conduct the study was requested and obtained from the college ethics committee, informed verbal and written consent was obtained from participants. Confidentiality of information was maintained throughout the study.

Methodology

Sample size estimation was done using the formula:

$$N = \frac{4pq}{d^2}$$

p= anticipated prevalence, taken as 8 based on literature available. 9 q = (100-p) =92, d =30% allowable error of "p" i.e, 2.4. The sample size was estimated to

be 512. Considering 20% of non-response rate, the final sample size of 625 was taken.

Method of measuring blood pressure

Blood pressure (BP) was measured by auscultatory method with a standardized calibrated mercury sphygmomanometer. The measurement was taken on the right arm with the subject in the sitting posture, with feet on the floor and arm supported at heart level.

Three readings were taken with a gap of 2 minutes each and the calculated mean of the three readings was considered as final reading. Hypertension is defined as blood pressure above 140/90 mmHg.

Anthropometric measurements

Weight was recorded to the nearest 100 gm using a standard weighing scale. Height was measured using a measuring tape to the nearest 0.1 cm. Students were requested to stand upright without footwear with their heels together and their back against the wall.

BMI was calculated using the formula, BMI=Weight (kg)/Height (m²).

Diagnostic criteria

Hypertension: Students with BP \geq 140/90 mmHg at the time of measurement were considered hypertensive and students with BP 120-139/80-90 mmHg were considered pre-hypertensive. ^{5,6}

Obesity: A BMI of $\geq 25 \text{ kg/m}^2$ was recorded as 'overweight' and BMI $\geq 30 \text{ kg/m}^2$ as 'obese'.

Statistical analysis

Data was collected by using pilot tested and were edited and coded and the results are analysed using statistical package for social sciences (SPSS) version 21.0. Tables were used to present frequency distribution and pattern of hypertension morbidity. Charts were used to present remarkable observations, also histogram and scatter diagram were used to show significant relationship between variables. Statistical significance for association was tested using Chi–square and p value less than 0.05 was considered statistically significance.

RESULTS

In the present study, Table 1 shows, a total of 625 students participated out of which 322 (51.52%) were males and 303(48.48%) were females. Hypertension was detected in 51 students giving a prevalence of 8.16%. The prevalence among males 37 (11.49%) was higher as compared to females 14 (4.62%). Pre-hypertension was detected in 137 (21.6%) of students out of which 79 (24.53%) were males and 58 (19.15%) were females. The

difference was found to be statistically significant (p<0.001), which indicates that sex has some influence in the association of hypertension (Table 1).

Table 1: Distribution of hypertensive cases by sex.

	Normal (%)	Pre- hypertension (%)	Hypertension (%)	Total
Male	206 (63.98)	79 (24.53)	37 (11.49)	322
Female	231 (76.23)	58 (19.15)	14 (4.62)	303
Total	437 (69.92)	137 (21.6)	51 (8.16)	625

 χ^2 = 14.45, p =0.000725, significant

Table 2 shows, a total of 625 students participated hypertension was detected and was more prevalence among 20-22 age group (45.44%) compared with other age groups. The relation to education was also studied in the present study, hypertension was mostly noted in the educated at an age group of 18 to 20 years with a percentage of 38.4.

Table 2: Socio-demographic profile.

Variables	Males	Females	Percentage				
Age (in years	Age (in years)						
18-20	164	172	53.76				
20-22	155	129	45.44				
>22	3	2	0.8				
Education (in years)							
18-20	128	112	38.4				
20-22	102	107	33.44				
> 22	92	84	28.16				
Total	322	303	100				

In Table 3 socio economic status classification is done using Modified B.G. Prasad's classification scale by collecting the data about family and per-capita monthly income of the students.

Table 3, shows the socio economic status of the present study, the maximum number of students were observed at scale 3 (56.8%) of Modified B.G. Prasad's classification scale.

Table 3: Socio economic status classification using Modified BG Prasad's classification scale.

SES	Males	Females	Percentage
1	26	24	8
2	102	98	32
3	183	172	56.8
4	11	9	3.2
5	0	0	0
Total	322	303	100

Table 4 shows, prevalence of hypertension according to the body mass index, most of the students with pre Hypertension and hypertension was seen in normal BMI (61.6%) when compare with underweight and overweight.

Table 4: Prevalence of hypertension according to the body mass index.

BMI	Normal	Pre- HTN	Hypertension	Total (%)
Under weight	151	2	1	154 (24.64)
Normal weight	274	102	9	385 (61.6)
Over weight	12	33	41	86 (13.76)
Total	437	137	51	625 (100)

 χ^2 =291.41, p<0.00001, Significant

Table 5: Prevalence of hypertension association with dietary intake.

Diet type	Normal	Pre- HTN	Hypertension	Total (%)
Mixed diet	385	123	45	553 (88.48)
Veg-diet	52	14	6	72 (11.52)
Total	437	137	51	625 (100)

 χ^2 =0.29, p=0.864, not significant

Table 6: Hypertension association with family history of hypertension and other co-morbidities.

Family history	Normal	Pre- HTN	Hypertension	Total (%)
Yes	68	53	27	148 (23.68)
No	369	84	24	477 (76.32)
Total	437	137	51	625 (100)

 χ^2 =57.17, p<0.00001, Significant

Above Table 5 and 6 shows hypertension association with dietary intake and family history of hypertension and other co-morbidities. Gender, age, marital status, occupation, education status, tobacco use, and physical activity were significantly associated with the hypertension status of the study subjects. Both the rate of prehypertension and hypertension were higher among normal when compared with under and overweight especially in males. Hypertension was found to be more among illiterate subjects, and with regard to prehypertension, primary educated subjects suffered more. Study subjects from lower and upper socioeconomic status were almost equal victims of hypertension (Table 2 and 3).

Figure 1 shows, tobacco use and alcohol use were found to be risk factors for being hypertensive in the study subjects. Although alcohol use was not significantly associated with hypertension status but rate of hypertension was higher among the alcohol and tobacco users.

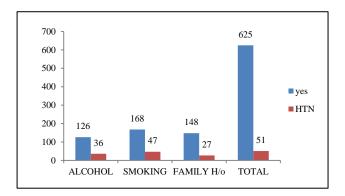


Figure 1: Hypertension association with alcohol intake, smoking and family history of hypertension..

DISCUSSION

India is a developing country and like other developing countries, it is going through a rapid demographic and epidemiological transition. In all such transitions, nutrition is the key ingredient and plays prime role. Blood pressure monitoring in young adults is useful for the early detection and management of hypertension. Repeated high BP measurements in adolescence are a predictor of adult hypertension. In the present study, 137 out of 625 students were found to be Pre-hypertensive, illustrating the necessity of monitoring blood pressure in this age group.

Blood pressure has been shown to vary according to constitutional factors such as age, weight, race and sex. The association between these factors and hypertension is known, although the mechanisms involved remain obscure. Different studies carried out by Indian workers revealed varying prevalence rate of hypertension among adult population depending upon the criteria taken for classification, age group and type of population studied. 10,11 In the present study, the prevalence among males was higher as compared to females. The difference was found to be statistically significant, which indicates that sex has some influence in the association of hypertension this proportionate increase of prevalence of hypertension as age advances in both sexes has been observed in many other studies. Bhavani and co-workers observed in a study in Andhra Pradesh that there was an increasing trend of hypertension as age advances and even in post-menopausal women, as the prevalence rate rose from 4% among young to 17.2% in 60 years of age group and similar findings was also contributed by Tadvi et al among both sexes. 12,13

Men are more often hypertensive than women attributable to differences in the hormonal regulation of blood pressure. Significant relationships between BMI, alcohol consumption, smoking, family history of hypertension and other co-morbidities were found among

the participants of our study. The occupational status has been found to have association with hypertension in the present study. Those who were in professional group had lesser prevalence rate as compared to other category of occupation. On the contrary Babu and co-workers found that hypertension was more common in professional group as compared to unskilled and semi-skilled groups, but some of the studies have shown any significant association between occupational status and hypertension. Probably, the level of occupation may materially affect physical activity and other aspect of life in relation to hypertension.

Among the overall alcoholics, very few percentage were normal followed by pre-hypertensive and many were found to have higher prevalence of hypertension. Statistical analysis was found to be significant indicating that alcohol is one of the risk factors in association with hypertension compared to non-alcoholics Benowitz et al reported similar finding that excessive alcohol intake is related to development of hypertension.¹⁷

There are so many studies which do not refute the finding of the present study that higher socioeconomic status is a risk for hypertension. We assume that better socioeconomic status imparts people with more purchasing power on fast and convenience foods and less physical activity which are already proven to be contributing risk factors for overweight and obesity that subsequently linked to hypertension.

CONCLUSION

Hypertension is a growing problem among young adults. Most of the cases were previously undiagnosed. The prevalence of hypertension among males was higher compared to females. The socio-demographic variables such as dietary habits, BMI, alcohol and tobacco consumption play a pivotal role in the prevalence of hypertension.

Early identification helps in formulating interventional strategies and active management of hypertension thereby minimizing complications such as cardiovascular changes and end organ damage later in life.

More studies need to be conducted as there is dearth in data on hypertension in the young adult population of this area in order to formulate preventive strategies at all levels.

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Institutional Ethics Committee

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