International Journal of Community Medicine and Public Health
Kumar U et al. Int J Community Med Public Health. 2017 Feb;4(2):424-427
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20170266

Original Research Article

Prevalence of hypertension among young adults in a Jaipur district of Rajasthan, India

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Received: 27 November 2016
Revised: 22 December 2016
Accepted: 23 December 2016

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ABSTRACT

Background: Young adults are failed to observe in studies on impact of high blood pressure as they are esteemed to be at a low risk of developing the complication or disease. Study of disease prevalence and their relation with life style habits provide the information required to develop interventional strategies. The objectives were to estimate the prevalence of hypertension among young adults in Jaipur district, Rajasthan and to study the impact of life style habits like tobacco use and alcohol consumption on hypertension.
Methods: Data were collected from 390 college students aged 18 years and older in selected degree college by a cross-sectional survey. Blood pressure recordings, anthropometric measurements as well as socio-demographic characteristics were collected.
Results: High blood pressure was observed in 152 out of the 390 students (38.97%), of which the 20 (5.13%) are hypertensive, majority were newly diagnosed (65%). Prevalence of high blood pressure among male students was higher (40.29% compared to 37.5% among female students). Out of total 33.85% and 5.12 % of the students were found to pre-hypertensive and hypertensive respectively. Prevalence of hypertension was found higher among those with a history of smoking or alcohol consumption.
Conclusions: Majority of students with high blood pressure (hypertensive stage) were previously undiagnosed. A large number of students were in pre-hypertensive stage. Their early identification and right intervention at right time will lessen the impact of high blood pressure in productive age.

Keywords: High blood pressure, Life style habits, Young adults

INTRODUCTION

Developing Countries have undergone rapid industrialization, Urbanization, Globalization and economic development over the last four decades. As a consequences, standard of living has improved but with a detrimental shift toward inappropriate dietary patterns and reduction in physical activities.[1] This health transition will ultimately effect the health of young adults with people in reproductive age group of present generation. Prevalence of Hypertension in India ranges from 17% to 29.8%.[2] Cardiovascular diseases are the leading cause of death globally, accounting for approximately 31% of all global deaths. Of these 17.5 million, 7.4 million were due to coronary heart disease and 6.7 million were due to stroke. Increased blood

pressure is one of the important risk factors of cardiovascular disease.[3] According to the WHO's World Health Statistics Report 2012, 21% world's adult population has raised blood pressure – a condition responsible for half of all deaths from stroke and heart disease. Hypertension contributes to 4.5 percent of the current global disease burden.[4] The prevalence of hypertension among young adults, is on a steady rise. This may be attributed by several factors such as changed lifestyle and education pattern that leads to stress. We have to improve detection rates by screening in school and colleges periodically.[5] Over 80 percent of cardiovascular deaths in developing countries are due to lack of widespread diagnosis and treatment at early stage as compared to developed countries.[6] India as developing countries face a dual burden of communicable and non-communicable diseases with shifting trend including hypertension, stroke and coronary artery disease. The primary aim of this study was to determine the prevalence of hypertension among college going young adults as per JNC-VII criteria[7], as there is a lack of data regarding high blood pressure among young adults.

METHODS

Study area

A cross-sectional study of students of selected degree colleges over the age of 18 years (18-25years) was conducted in the Jaipur district of Rajasthan, North India. A total of 394 students elected to participate and were administered the survey questionnaire at random, of which 390 participated in the study.

Sample size estimation

Sample size = 1.96×1.96 p q /d2,

p= Prevalence (10% by review of literature) = 0.1

q = (1-P) = 0.9

d=relative precision, set at 30% of Prevalence.

Using the above mentioned values a sample size of 384 was obtained. Considering a non-response rate of 10 %, the final sample size was calculated to be 422.

Sampling and data collection

All eligible students in the respective colleges (B tech) were chosen randomly until we met the required sample size. Clearance was obtained from the concerned college authorities following which written informed consent was taken from participants prior to the administration of semi-structured questionnaires. Part of the questionnaire was filled in by the students and the rest by the investigator following the necessary physical examination

Method of measuring blood pressure

Blood Pressure was measured for all eligible students, on the right arm in sitting posture, with subject in a relaxed state. Standardized mercury sphygmomanometer with adult size cuff was used. Two readings of blood pressure were obtained five minutes apart and average of the readings was taken as the final blood pressure reading. Those found to have hypertension were informed about their blood pressure status and were refer to JNU hospital medicine OPD for further management.

Waist circumference was measured to the nearest 0.1 cm at the mid-point between the costal margin and iliac-crest, using a measuring tape, at the end of normal expiration with the subject standing erect in a relaxed position, feet 25-30 cm apart. Hip circumference was measured at the level of greater trochanters (widest portion of the hip) to the nearest 0.1 cm with measuring tape, with the subject standing with the arm by the side and feet together. Waist-Hip ratio was calculated as the ratio of waist circumference over hip circumference.[8]

Diagnostic criteria

Hypertension

A student was considered hypertensive if he/she had been previously diagnosed and/or on treatment OR if the systolic blood pressure was ≥140 mm of mercury or diastolic blood pressure was ≥90 mm of mercury at the time of measurement (JNC-VII criteria).[7]

Obesity

Waist hip ratio of >1 for males and >0.85 for females were designated as Truncal obesity while waist circumferences of ≥94 cm in males and ≥80 cm in females were designated as Central or Abdominal obesity.[9,10]

Data analysis

Data was entered and analyzed in R statistical software and Chi-square tests were applied to analyze the relationship between different variables and hypertension.

RESULTS

During the study 394 questionnaires were distributed. Of them, 390 filled up the questionnaire and physically examined. Nearly 70% of the students were between 18 and 19 years and over 95% were under 21 years (Table 1). The proportion of males (53.3%) and females (46.7%) was comparable. Hypertension was detected in 20 of the 390 students (prevalence=5.1%), of which the majority were newly diagnosed (65%). The prevalence of hypertension among male students (6.7%) was higher as compared to female students (3.29%) Table 2. In addition, 33.85 % of the subjects were found to have

blood pressures in the pre-hypertensive range (Figure 1). A higher prevalence was found among students with history of smoking (52.5%) and alcohol intake (32.3%) as compared to prevalence among the remaining students (Table 3).

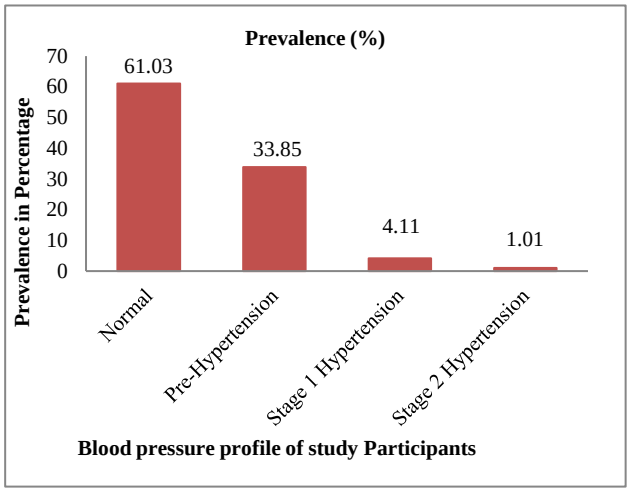

Figure 1: Blood pressure profile of students according to JNC-VII criteria.

Table 1: Characteristics of the study participants.

Variable	Number(n=390)	Percentage
Age in years		
18-21	289	74.1
22-25	101	25.9
Gender		
Male	208	53.3
Female	182	46.7
Religion		
Hindu	287	73.6
Muslim	74	18.9
Christian	29	7.4

Table 2: Prevalence of hypertension.

Gender	Number of students examined	Number of students with hypertension	Prevalence of hypertension in %
Male	208	14	6.7
Female	182	6	3.2
Total	390	20	5.1

$X_2 = 2.35$, p= 0.13.

Table 3: History of smoking and alcohol intake with hypertension.

History of Tobacco consumption	Number of students examined	Number of students with hypertension	Prevalence of hypertension (%)
Present	126	11	8.73
Absent	264	9	3.41
Total	390	20	5.12
X^2 =4.96, p =0.25			
History of alcohol intake			
Present	123	11	8.94
Absent	267	9	2.45
Total	390	20	5.12
X^2 =5.37, p =0.02			

DISCUSSION

The persistence of raised blood pressure during childhood and adolescent period and its progression into adult hypertension has been observed in the past. High BP measurements at multiple times in adolescent age group are a predictor of adult hypertension.[11] Therefore regular Blood pressure monitoring in young adults is recommended for the early detection and management of hypertension in early stage.

High Prevalence of increased blood pressure was found among the participants in this study. Similarly, high prevalence have been demonstrated in earlier studies in same age group.[12] About 35% of study subjects was found to be pre-hypertensive, illustrating the necessity of monitoring blood pressure in young adults.

Earlier studies have depicted factors associated with development of hypertension in young adults. Among various factors the most important association was found between obesity and hypertension. Obesity indicators (WHR and waist circumference) have been repeatedly proven to possess a significant positive correlation with elevated blood pressure (systolic and diastolic).[13-16] Relationships between alcohol consumption or smoking and hypertension were not found significant among the participants of our study.

CONCLUSION

High blood pressure has always been a major health hazard among young adults. Most of the cases remain undiagnosed in the initial stages. Pre-hypertensive cases require regular follow-up. Early identification plays important role since it leads to early management of

hypertension thereby reducing complications, such as cardiovascular changes and end organ damage later in life. Further studies need to be conducted as there is lack of data on hypertension in the young adult population in order to formulate right preventive strategies at right time.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Kumar U, Sharma OP, Goyal J, Sain S, Gupta B, Rajendra GA. Prevalence of hypertension among young adults in a Jaipur district of Rajasthan, India. Int J Community Med Public Health 2017;4:424-7.