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RESEARCH ARTICLE

A CROSS SECTIONAL STUDY TO ESTIMATE THE PREVALENCE OF PREHYPERTENSION AMONG MBBS STUDENTS

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Abstract

Context: Blood Pressure guidelines to pre-hypertension defines it as systolic blood pressure of 120-139mmHg or diastolic blood pressure of 80-89mmHg in adults.

Aim: To estimate the burden of prehypertension among MBBS Students admitted at Tertiary care centre in India.

Methods: A cross sectional study conducted at tertiary care centre in India, among 350 MBBS students (academic year 2015-2018) and 50 interns (academic year 2014) of Maharaja Agrasen Medical College (MAMC), Agroha, Hisar, Haryana. Blood pressure of all subjects was measured. A total of three readings were recorded and the lowest of three readings was taken.

Statistical analysis: Data was entered into MS excel sheet and prevalence was calculated accordingly.

Results: The overall prevalence of prehypertension among MBBS students came out to be 44.25%, while none of the study subject was hypertensive in this study. The students hailed from urban and rural background. It was seen that maximum prevalence (52%) of prehypertension was among third year MBBS students.

Conclusion: Subjects at risk of pre hypertension need proper evaluation and appropriate management to prevent serious, long term complications. If the rise in BP with age could be prevented or diminished, much of hypertension, cardiovascular, renal diseases and stroke might be prevented.

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Introduction:-

Pre-hypertension is a growing and a next point for developing hypertension because of its high prevalence and long term complications. Joint National Committee's (JNC VII) in 2003 introduced the new concept and has designated a new category called Pre-hypertension. Blood Pressure guidelines to pre-hypertension defines it as systolic blood pressure of 120-139mmHg or diastolic blood pressure of 80-89mmHg in adults of age 18 years and older.¹ This new category is a continuum to hypertension.

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A classic 1939 study conducted by Robinson and Brucer observed that there was a sharp increase in mortality among individuals with BP measurements greater than 140/90 mmHg, giving rise to the usual clinical definition of hypertension.² The investigators also observed that systolic BP in the range 120-140 mmHg, especially in younger individuals, was associated with progression to definitive hypertension and cardiovascular disease later in life.²

The history of hypertension goes back a long way in ancient Indian Ayurveda medicine where the quality of an individual's pulse as felt by gentle palpation by the trained physician, was a window into the condition of the cardiovascular system. What was called "hard pulse" possibly would qualify for the modern term of hypertension.³

Any article on the history of hypertension however is incomplete without a mention of Akbar Mohamed's contribution in developing the modern concept of hypertension. In the late nineteenth century Frederick Akbar Mohamed (1849–1884), an Irish-Indian physician working at Guy's hospital in London first described conditions that later came to be known as "essential hypertension".³

Hypertension, however, was not always considered a disease as we know it now. American President Franklin Roosevelt died in 1945 due to hemorrhagic stroke, his health records showed that despite having high blood pressure ~220/120 he was given clearance of health by his physician. Three years after his death, the National Heart Act was passed. The Act created the path for the study of heart diseases and resulted in several studies including the Framingham Heart Study.⁴

Globally, as per WHO around 7.5 million deaths or 12.8% of the total of all annual deaths worldwide occur due to high blood pressure. It is predicted to be increased to 1.56 billion adults with hypertension in 2025. In India, hypertension is the leading non communicable disease risk and estimated to be attributable for nearly 10.8 per cent of all deaths.⁵ As per ICMR, hypertension causes 29% of all stroke and 24% of heart attacks. Around 2.6 lakh Indians die in India due to hypertension. This stresses the need for effective control and management to prevent future problems.

High blood pressure is increasing in the India due to rapid urbanization and globalization leading to adoption of unhealthy lifestyles. Many people are unaware that they have high blood pressure and remain undiagnosed.

According to Framingham heart study, pre-hypertensive individuals have 2 times higher risk of progression to hypertension than normotensive persons. Pre-hypertension is associated with same traditional cardiovascular risk factors as hypertension, such as smoking, alcohol, decreased physical activity, obesity, diabetes mellitus, dyslipidemia and stress.⁶ The seventh report of the Joint National Committee on hypertension recommended only lifestyle changes for pre-hypertensives.¹

Professionals particularly doctors are more susceptible for developing hypertension and pre hypertension due to their level of stress and demanding work profiles. Medical students are particularly also at risk of developing this condition due to the risk factors associated as sedentary lifestyle, smoking, alcohol intake, unsuitable eating habits and stress related to excel in examination. While India, emerging as an economically developed nation, the need of the hour is to focus on research and data collection so as to prevent future emerging problems related with Non Communicable Diseases.

Aim & Objectives:-

To estimate the burden of prehypertension among MBBS Students admitted at tertiary care centre in India.

Material & Methods:-

This cross sectional study was conducted among 350 MBBS students (academic year 2015-2018) and 50 interns (academic year 2014) of Maharaja Agrasen Medical College (MAMC), Haryana.

Permission from ethical committee of the institute was taken before starting of the study. Participation of all study subjects was voluntary and informed consent was taken to seek their permission.

Blood pressure of all study subjects was measured using a standard sphygmomanometer by auscultatory method in sitting posture after significant resting period of five minutes. A total of three readings were recorded and the lowest of all three readings was taken into consideration.

Pre-hypertension i.e. 120-139/80-89 mmHg was classified as per the Joint National Committee – 7.

Data was entered into MS excel sheet and prevalence was calculated appropriately. Obtained result is shown in form of tables, pie charts and bar charts.

Results:-

The overall prevalence of prehypertension among MBBS students came out to be 44.25%, while none of the study subject was hypertensive in this study (Figure 1). The students hailed from urban and rural background.

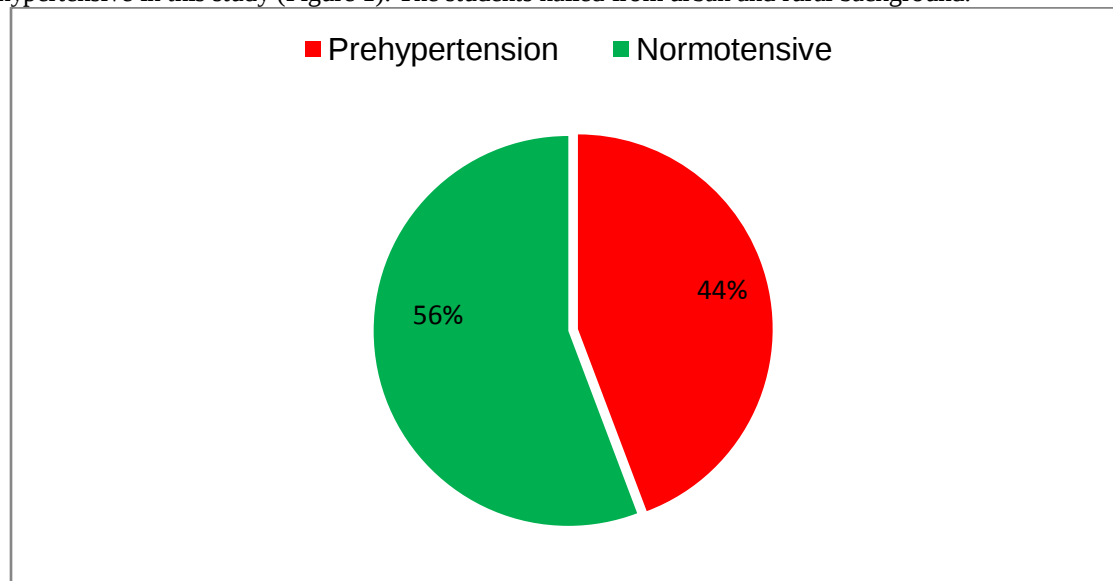


Figure 1:- Prevalence of prehypertension among MBBS students.

First Year MBBS Students

There were total 100 students admitted in first year, out of which 57% were females and 43% were males. The overall prevalence of prehypertension among first year MBBS students was 49%.

Second Year MBBS students

Out of 100 MBBS students pursuing second year MBBS, 45% were females and 55% were males. There were 36% of subjects under prehypertensive category, while 64% were normotensive.

Third year MBBS Students

Majority of prehypertensives were belonging to third year in this study. Prehypertensives comprises of 52%. Out of 100 students 44% were females and 56% were males.

Fourth year MBBS students

There were 50 MBBS students pursuing MBBS in fourth year, among which 48% were females and 52% were males. The overall prevalence of prehypertension was 14%.

Interns

The prevalence of prehypertension among interns was 26%. Out of 50 interns 44% were males and 56% were the females.

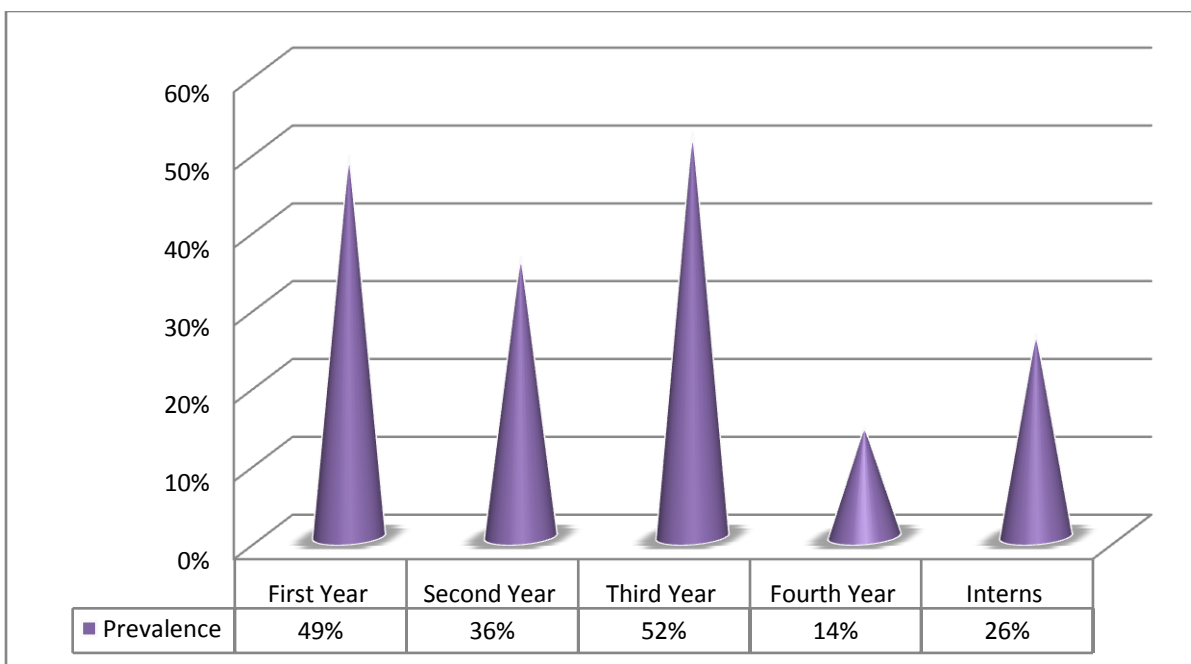


Figure2:- Prehypertension as per academic year.

Discussion:-

The overall prevalence of prehypertension among 400 students admitted at Maharaja Agrasen Medical College, Agroha came out to be 44.25% as per JNC VII classification. Further it was seen that maximum prevalence (52%) of prehypertension was seen among students of third year of MBBS while minimum (14%) among students of final year.

The higher rate observed in third year followed by first year, second year, internship and final year could be based on assumption that the prehypertension stage among students varies due to little physical activity, altered food habits or recreational social activities. Students become more relaxed and comprehensive in third year due to less study stress as there are minimum number of subjects to appear in examination, hence this could influence the dietary factors and recreational factors among study subjects.

The finding of prehypertension in present study are almost similar with a cross sectional study conducted by Debbarma A et al⁷ among medical students at Agartala Medical College, Tripura where the prevalence of prehypertension was 45% and hypertension and optimum BP was found to be 4% and 51% respectively. To addition in our study none of study subjects was found to be hypertensive.

Another study conducted by **Kishor Kumar C et al** among medical students in Pondicherry found that prevalence of elevated Blood pressure (pre-hypertension and hypertension) as per JNC 7 criteria, among medical students was 42.4%⁸

A much higher prevalence (55.4%) was seen in study done by Shetty S.S et al⁹ among 500 medical students at at Coastal Karnataka. Similarly, Kumar H, et al¹⁰ in their Cross sectional study done at Dehradun, Uttarakhand among students of tertiary care institute concluded found the overall prevalence of prehypertension to be 58.75% among 400 students enrolled in study.

Whereas, prevalence rate is contrary to study done by Verma D et al among 120 medical students in UP found that the prevalence of prehypertension was 38.3% while 5.8% and 2.5% were in stage I and stage 2 of hypertension respectively.

The observed difference of prevalence among different studies could be due to assumed due to variation in geographical, dietary and socio-economic factors.

Subjects at risk of pre hypertension need proper evaluation and appropriate management to prevent serious, long term complications. The prevention and management of hypertension are major public health challenges. If the rise in BP with age could be prevented or diminished, much of hypertension, cardiovascular and renal disease, and stroke might be prevented.¹¹

Conflict of Interest:

None.

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