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A study on hypertension and its correlates of lifestyle habits among the medical students of Indira Gandhi Institute of Medical Sciences, Patna

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Abstract
Hypertension is the commonest cardiovascular disorder and one of the leading causes of global burden of diseases. Medical students are significant investment to the society and increasing emergence of hypertension among them is a topic of interest today. With this background a study was conducted to assess the prevalence 0f hypertension and its correlates of lifestyle habits among the M 385 students of IGIMS, Patna. In this cross sectional study total 200 MBBS students were selected (50 students from each year) using stratified random sampling method. Data was obtained using a pre-designed semi structured questionnaire; weight and height was measured and to show association Chi square test, Pearson's correlation test, univariate logistic regression model was used. In this study we found the prevalence of hypertension among study participants was 10%, also there was statistically significant correlation found between systolic blood pressure and age, height, weight and BM of the respondents. Although in our study no significant association was found among hypertension and its correlates of lifestyle habits. Still the prevalence of pre-hypertension was 48.5% among the study participants which is a risk factor for development of hypertension in future, therefore dietary and lifestyle modification programmes directed especially to them is necessary.
Keywords: *Hypertension, Pre hypertension, Medical students, Lifestyle habits.*

Introduction

Hypertension or high blood pressure is one of the leading causes of the global burden of disease. Approximately 7.6 million (13-15% of total) and 92 million disability-adjusted life years worldwide were attributable to high blood pressure in 2001. Cardiovascular diseases are projected to cause 4.6 million deaths in India by 2020[2]. The prevalence of hypertension in India is reported as ranging from 10 to 30.9 %[3]. The average prevalence of hypertension in India is 25% in urban and 10% in rural in habitants[4].

Hypertension is the commonest cardiovascular disorder accounting for 20-50% of all cardiovascular deaths and also a leading cause of stroke, blindness, renal failure and congestive

heart failure[5]. Moderate elevation in arterial pressure leads to shortened life expectancy. Dietary and lifestyle changes can improve blood pressure control and decreases the risk of associated health complication, although drug treatment may improve blood pressure control and decrease the risk of associate health complications, although drug treatment may prove ineffective or insufficient[6]. Community survey in India have documented that between 3-6 decades prevalence of hypertension has increased by almost 30 times among urban dwellers and by about 10 times among rural inhabitants. Various factors might have contributed to this rising trend like changing life style, environment, diet, are stress, industrialization and urbanization etc. Medical students are exposed to many risk factors that result from the peculiar ways of education and stressful environment during their courses and examinations, which may affect their psycho-social wellbeing[16]. Many health and health related problems may be encountered and slightly prevalent among medical students Weight problems, lack of physical activity, lack of sleep, the acquisition of new habits; such as smoking or drug u e, difficulty in stress management and unhealthy dietary pattern are some examples of such problems[17].

The incidence of hypertension among students is also increasing. The main cause and risk factor of this increment is life style changes, increasing environmental stress, total calorie intake, food habits, less dietary fibers. Obesity, alcohol consumption, tobacco chewing and smoking etc these are modifiable but there are some other risk factors which are non-modifiable e.g. age, sex, genetic factors, ethnicity. Hence this study has done mainly concern with the evaluation of relation between these factors and hypertension among the IGIMS students. Healthy dietary habits among medical students are even more important as they are future physicians and the students who personally ignore adopting healthy lifestyle are more like y to fail to establish health promotion opportunities for their patients. Also, medical

students have been shown to exhibit early risk factors for chronic diseases[22].

This study aims at assessing the prevalence of hypertension and its correlates of lifestyle habits among the MBBS students of IGIMS, Patna.

Materials and Methods

This cross sectional epidemiological study was conducted from April 2014 to May 2015 on 200 MBBS students to study the nutritional assessment of medical students. Using a stratified random sampling, 50 students were randomly selected from each year as strata. Only those students (male and female) were selected who gave the consent to participate in the study. Data was collected by a team of 18 MBBS students of 6th semesters posted in the department of general medicine.

1. Anticipated population prop. = p=50% (=0.5)
2. Type I error (5%) (i.e. confidence level =95%)
3. Precision required on either side of the proportion (=d) =10% (i.e. between 10-20%) (=0.1)
   Sample size: n=200

Minimum requirement of sample size for the study is 100 MBBS students from IGIMS, Patna. Annual intake in IGIMS, Patna is 100 students and we take the fifty students form each year for our study. Our study target is 200 students for more precise information regarding our objectives and equal distribution for each stratum.

A predesigned semi structured schedule was used to elicit the necessary information and data collection. Both, verbal and written consents were taken before including a student in the study. Strict confidentiality was maintained about the analyzed data. First a questionnaire which contains 2 parts was prepared. Part A consisted of two sets of questions. in first set, particulars of the sub) etc, total calorie consumption using 24 hrs recall method was included and in next set, options were given to the subject to choose the items and their amount, where we tried to elicit information about their food habit. Then questions regarding their life style and physical exercise and

in second part ire. Part B, we performed necessary physical examinations and biometric measurements (like height, weight, blood pressure, general appearance, eyes, oral examination, skin, nails, etc).

During the course of the interview, two measurements of blood pressure on each study participant with a mercury column sphygmomanometer (cuff size 50 cm in length and 15 cm in width) were made using a standardized technique 30 minutes apart in sitting position. Blood pressure measurements were made on the left arm of each Study 'Subject, using a cuff of appropriate size at the level of the heart. In case where the two readings differed by over 10 mm of Hg, a third reading was obtained, and the three Measurements were averaged. The pressures at which sound appeared and disappeared Were taken as systolic blood pressure (SBP) and diastolic blood pressure (DBP) respectively. Body weight was measured (to the nearest 0.5kg) with the subject standing motionless on the Bathroom weighing scale, feet about 15cm apart and weight equally distributed on each leg. Subjects were instructed to wear minimum outwear (as culturally

appropriate) and no footwear while there weight was being measured. Height was measured on a vertical scale with heels, buttocks, occiput against the wall and head in Frankfurt plane, to the nearest 0.5cm.

Tests of significance like Pearson's Chi-square test applied to find out the results. P-values <0.05 were considered significant for the identified risk factors and outcome variables. Univariate logistic regression analysis was done using systolic and diastolic blood pressure as the dependent variable and the various risk factors identified as independent variables.

Inclusion Criteria
- MBBS students of IGIMS, Patna clinically healthy gave consent to participate in the study.

Exclusion Criteria
- Known cardiovascular disease, hypertension.
- Did not give consent to participate.
- Using antihypertensive or other cardiovascular drugs
- Using any drugs that can affect BP, weight.

Operational Definitions
Joint National committee (JNC) classification of hypertension

CATEGORY	STUDY BLOOD PRESSURE (mm Hg)	DIASTOLIC BLOOD PRESSURE (mm Hg)
Normal	<120	And <80
Pre- hypertension	120-139	Or 80-89
Stag -1 hypertension	140-159	Or 90-99
Stage-2 hypertension	≥160	Or ≥100

Evaluation and treatment of hypertension (JNCVII) criteria[7].

Normal and pre-hypertension is grouped as no hypertension and hypertension is grouped as stage 1 and stage 2.

Total calorie intake in kilocalories
The relationship between the two units of energy is as follows:

1 kcal = 4.184 KJ (Kilo joule)

1K1=0.239kcal

1000 kcal =4184 KJ =4.18 MJ (Mega joule)

1 MJ = 239 kcal[8]

Recommended Dietary Allowance (RDA)
The average daily dietary nutrient intake level sufficient to meet the nutrient requirement of nearly all (97 to 98 percent) healthy individuals in a particular life stage and gender group[8].

According to RDA 2010 College going students comes sedentary worker group according to which RDA value for them are as follows;

Male: 2318 kcal.

Female: 1899 kcal.

Body Mass index (IBM):

Body Mass index was calculated as weight in kilograms divided by weight in meters squared. Based on their BMl, individuals were classified into four groups:

1. Underweight-(BMI< 18.5)
2. Normal-(BMI = 18.5-24.9) and
3. Overweight (BMI > 25).

Joint Family:

Joint Family System (JFS) comprises of two or more blood related nuclear families that form a corporate economic unit[14].

Nuclear Family:

Nuclear Family System (NFS) is a family unit consisting of parents and their dependent children [15].

A family unit consisting of a single married or unmarried individual was also grouped under a nuclear family system.

Fatty food: we include consumption of cake, cookies, pizza, sweet, beef, pork from the questionnaire Junk food: consumption of samosa, roll, panipuri, chips, ice cream, soft drink.

Results

This study shows that out of the total 200 participants 128 were males and 72 females; the mean age, for males (20.84±1.16) and for females (20.63±1.215) years. Mean weight, males (62.67±8.616) kg and females (52.24±7.445) kg. Mean height, males (166.16±5.661) cm and females (154.56±5.295) cm; whereas mean BMI for males is (22.709±2.987) and females (21.907±3.255) kg/m2.Table no. 1 shows the distribution of age, height, weight and BMI according to the gender of study participants.

Table no.-1: Demographic characteristic of study participants

Variables	Total (n=200) mean ± SD	
	Male(n=128)	Female(n=72)
Age (years)	20.81±1.160	20.63±1.215
Weight (kg)	62.67±8.616	52.24±7.445
Height (cm)	166.16±5.661	154.56±5.295
BMI (kg/m^2)	22.709±2.987	21.907±3.255

Table no. 2 shows category of blood pressure of medical students according to their age distribution (study participants were having minimum age of 18 years and maximum of 23 years). Out of the total 200 study participants 90% were having no hypertension (41.5% were having normal BP and 48.5% having pre hypertension) whereas, 10% of the students had hypertension (8% stage 1 and 2% stage 2 hypertension).

Table.2: category of BP of medical students according to their Age

Age of the respondents	Category of BP of Medical students				Total
	Normal	Pre HTN	Stage 1 HTN	Stage 2 HTN	Normal
18	1	2	0	0	3
19	21	8	2	0	31
20	20	24	4	0	48
21	22	32	5	2	61
22	15	24	3	2	44
23	4	6	2	0	13
Total	83 (41.5%)	96 (48.5%)	16 (8%)	4 (2%)	200 (100%)

Table no.3 demonstrates the correlation of systolic and diastolic blood pressure with age, height, weight and BMI. Although diastolic blood pressure did not show any significant correlation with age, height, weight and BMI but systolic blood pressure significantly correlates (p value< 0.05) with each of these variables.

Variables	Systolic blood pressure		Diastolic blood pressure	
	Correlation coefficient	Significance (P value)	Correlation coefficient	Significance (P value)
Age (years)	0.177*	0.012	0.095	0.183
Weight (kg)	0.331**	<0.001	0.085	0.232
Height (cm)	0.412**	<0.001	0.075	0.289
BMI (kg/m^2)	0.260**	<0.001	0.031	0.666

* Correlation is significant at 0.05 level (2-tailed)   ** Correlation is significant at 0.01 level (2-tailed)

Table no. 4 shows the association between various factors related to lifestyle of medical students and their hypertensive status. We found no statistically significant difference in the prevalence of hypertension according to age, gender, BMI category of the study participants, physical exercise, smoking or chewing tobacco, drinking alcohol, calorie consumption according to RDA, consumption of junk food and fatty food.

Table no.-4 Association between various factors related to lifestyle and hypertension status of medical students.

Variable	Hypertension		Total(n=200)	Significance value**
	Yes	No		
Age (Years)				
19	29	2	31	0.875
20	44	4	48	
21	54	7	61	
22	39	5	44	
23	11	2	13	
Gender				
Male	112	16	128	0.116
Female	68	4	72	
BMI category				
Under weight	21	2	23	0.955
Normal weight	126	14	140	
Over weight	32	4	36	
Physical exercise				
Yes	112	13	125	0.808
No	68	7	75	
Smoking or chewing tobacco				
Yes	3	1	4	0.312
No	177	19	196	
Drinking alcohol				
Yes	11	1	12	0.843
No	169	19	188	
Calorie consumption				
Less than RDA	79	11	90	0.343
More than RDA	101	9	110	
Consumption of junk food				
<5 times a week	54	7	61	0.766
>5 times a week	125	14	139	
Consumption of fatty food				
< 5 times a week	105	8	113	0.072

* 3 cases were not include for analysis of age.   ** chi square test, p value <0.05 considered as significant.

Discussion

Total 200 students participated in our study, among them 64% (n=128) were male participants, whereas female participants were 36% (n=72). The demographic data of the participants are more or less similar to the study conducted by Salve 5.8. at al[20] where 61.48% are male and 38.52% are female students. Mean age of the students were 20.77±1.18, for females it was 20.63±1.215, whereas for males it was 20.84±1.16, which is similar to what was found in the study conducted by Shaimaa B. Abdelaziz et al[23] regarding "Health and Lifestyle Assessment among Medical Students of El Kaerl Aini" in Cairo University, 2012; Where the mean age of males were (19.8±1.25) years, while that of females were (19.2±1.l7) years. The prevalence of hypertension among our study participants was 10%, which is higher than what has been found by Nur Naim et al in a study conducted among high school children of Turkey[11]. The reason for difference in prevalence of hypertension among these two studies might be because of difference in age group of study subjects. In the present study systolic blood pressure correlated positively and significantly 'with age, height, weight and BMI of the study participants which is quite similar to what has been found by Nur Naim et al[11] in their study. The average prevalence of hypertension in India is 25% in urban and 10% in rural inhabitants

[7]. The prevalence of hypertension according to JNC VII criteria was 7.16%. There are not many studies on blood pressure of adolescents in our country. A study from Jaipur[21] reported prevalence of hypertension among 13 to 17 years age group to be 7.2%. Gopinath et al observed an overall prevalence of 3.1% among 15 to 24 years age group people of urban area of Delhi[22]. Our study showed higher prevalence of hypertension than all the above mentioned studies. No significant association was found in our study between various factors related to the lifestyle of our study participants e.g. age, gender, BMl category, physical exercise, smoking or chewing tobacco, drinking alcohol, calorie consumption according to RDA, consumption of junk food and fatty food etc. and hypertension. Although our study showed that 43.5% students were taking fatty foods more than 5 times in a week, compared to 74.6% which was shown in a study conducted by Shaimaa B. Abdelaziz et al[23], it may be due to difference in the nutritional pattern of our country and the gulf region. Our study also showed that 69.5% students taking junk foods more than 5 times in a week, which is much higher than 32.3% which is shown in a study conducted by Shaimaa B. Abdelaziz et al[23], which may be due to adoption of poor dietary habits. And our study also showed that 71.9% male and 65. 3% female consume junk foods more than 5 times in week. Which shows that female take less amount of junk foods compared to the males which is similar to the study conducted by Mahasti Alizadeh et al[25]. It was also found in our study that 62.5% students are engaged with exercise which is higher than 25.3% what we have found in the study conducted by Shaimaa B. Abdelaziz et al[23].

In our study 2% students were smokers which concides with similar percentage 3% in a study conducted by Anne 0. Carterlet al[24]. On the contrary which is much lesser than what we have found, the study conducted by Shaimaa B. Abdelaziz et al[23], which shows prevalence of smoking 510%, and other studies like the study conducted by Mahasti Aliza deh et al[18] found

14%. One possible explanation for the finding is cultural variation between the countries. The finding in our study that Smoking or tobacco use was not associated with hypertension, match with the finding of a study conducted amongst rural population of Maharashtra[12]. In the present study 6% of students of AGMC take alcohol which coincides with what was found in a study conducted by Kurubaran Ganasegeran et al[23] but higher than what was found by Anne 0. Carterlet al[24]. Which states the frequency to be 1%.WHO, technical report series, 1996, showed significant relationship between alcohol consumption and hypertension. Alcohol consumption has been consistently related to high blood pressure in cross-sectional as well as prospective observational studies in several populations in previous studies[13].

Conclusion

As the prevalence of hypertension is high among the MBBS students of IGIMS, Patna an appropriate intervention programme should be launched with the aim to reduce the mean blood pressure of the medical students. Moreover 48.5% of the study participants were in the pre hypertensive phase which although was not a disease status yet but it is important to identify these individuals who are at high risk of developing hypertensive disease in future. Advice on lifestyle and dietary modification to the students in pre hypertensive phase will go in long way in preventing development of hypertension and chronic diseases in future.

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