EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES

http://www.ejbps.com

ISSN 2349-8870
Volume: 9
Issue: 1
414-418
Year: 2022

PREVALENCE OF CARDIOVASCULAR RISK FACTORS AMONG MBBS AND BDS STUDENTS IN GMC SRINAGAR

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Article Received on 17/11/2021 **Article Revised on 06/12/2021** **Article Accepted on 27/12/2021**

ABSTRACT

Introduction: Cardiovascular diseases (CVDs) have posed a great threat to the health and well-being of people all over the world. It has been estimated that about 31% of all deaths in the world are caused due to the CVDs. **Objectives:** This study was aimed to see the prevalence of CVDs among medical students and the correlation of waist hip ratio with CVDs. **Material and Methods:** A total of 200 students, 100 from MBBS and 100 from BDS were selected. Furthermore, each group consisted of 50% participants of either sex. Data was collected and analysed by Chi-square and Fisher Exact test using SPSS 23.0 version. **Results:** The mean age of the students was 19.41±1.64 years. It was observed that percentage of students who were obese was almost same but 29% of BDS students were overweight in comparison to 11% of MBBS students and the difference was statistically significant ($P<0.05$). Both WC and WHR were found significantly higher ($P=0.006$) in female students (24% and 60% respectively) than their male counterparts (10% and 39%). Furthermore, the Physical inactivity was also more prevalent in the female students (84%) than their male counterparts (46%). On the contrary. The male BDS students showed higher percentage of students with elevated BP than other subgroups. **Conclusion:** It was found higher prevalence of CVD risk factors like overweight, increased WC, increased WHR among the female students and more so belonging to the BDS stream. However, elevated BP was found more in the male BDS students.

KEYWORDS: cardiovascular diseases, MBBS, BDS, BMI, Obesity, Waist circumference, Waist to Hip ratio, Hypertension.

INTRODUCTION

According to the World Health Organization (WHO), in the year 2019, approximately 17.9 million people died from cardiovascular diseases (CVDs) that constituted about 32% of all global deaths and of these deaths, 85% were due to heart attack and stroke.[1] The middle- and low-income countries were most affected and constituted about 75% of the deaths. The major risk factors of CVD include physical inactivity, unhealthy diet, obesity, harmful use of alcohol, diabetes, hypertension, and hyperlipidemia.[1] CVDs have been the leading cause of morbidity and mortality in India and its prevalence in India is on rise.[2,3] To emphasize still further, over the past 30 years the prevalence of many cardiovascular risk factors such as, hypertension, diabetes mellitus and dyslipidemia has markedly increased in India.[4] According to the recent studies a high prevalence of cardiovascular risk factors such as obesity, hypertension and low physical activities, among the college going students suggest that the disease has started to affect the younger population and this trend is worrisome among the student population in countries such as Poland, USA, and Greece.[5,6,7] Studies suggest that the developing countries have earlier age of onset of CVDs and greater mortality.[8] The CVDs are reported atleast a decade earlier in South Asians as compared to their western counterparts.[9,10] Risk factors start to appear at a very early age and manifest with advancing age.[8]

The consumption of unhealthy diet and lack of physical activity among the college going students of our country pose a real threat to the overall health and increase in the cardiovascular risk factors, in particular. Therefore, preventive and interventional measures are required to be put in place to prevent this deadly trend. There are various studies which point towards the unhealthy practices and prevalence of various cardiovascular risk factors among the MBBS and BDS students. This study was aimed to see the prevalence and various corelates of CVDs in medical students.

MATERIAL AND METHODS

This cross-sectional observational study was conducted in the Department of Physiology, Government Medical College, Srinagar, India. A validated and structured questionnaire was formulated that catered to the objectives of the study. A total of 200 students, 100 from the MBBS and 100 from the BDS, which included both genders, aged between 18-24 years were enrolled for the study. The study was initiated after the permission from the ethical committee. A well-informed written consent was taken from the students prior to the study. Anthropometric measurements like height, weight, waist and hip circumference, BMI, waist to hip ratio (WHR) and Blood pressure were recorded. For measuring physical activity, the WHO Global Physical Activity Questionnaire (GPAQ) was used, with suitable modifications.[11]

Height was measured using a Seca 213 (Hamburg, Germany) stadiometer to the nearest 0.5 cm, and weight was measured by a standard weighing Scale (Omron HN 289, Taiwan) to the nearest 0.5kg, with the student having removed his/her footwear for both measurements. BMI was calculated by dividing weight (kg) by square of height (m). Waist circumference was measured using a non-stretchable tape, to the nearest 0.1 cm, at the midpoint between tip of iliac crest and last costal margin in the back, and at umbilicus in the front, at the end of normal expiration, with subject standing erect in a relaxed position. BP was measured using a digital sphygmomanometer (Omron HEM-7156-A, Taiwan) in the right arm, with the student in sitting position after five minutes of rest. BP was measured three times with an interval of 60 seconds, and the average of the three measurements was used in analysis.[12]

For the purpose of this study, the definition of BMI selected was as per the Asian norms i.e., BMI (kg/m^2) <18.0 underweight; 18.0-22.9 normal; 23.0-24.9 overweight; >25 obese.[13] The cut-offs selected for waist circumference (WC) was <=85 cm for men and <=80cm for women as having low risk, and for waist-hip ratio (WHR) was <=0.89 for men and <=0.81 for women as having low risk.[14] The JNC-7 classification of hypertension was used to determine cut-offs for hypertension (systolic blood pressure (SBP) >=140 mmHg and/or diastolic blood pressure (DBP) >=90mmHg).[12] WHO GPAQ analysis guidelines were used for analysing the physical activity of the participants. The activities were classified as 'vigorous' and 'moderate' based on the elevation of heart rate, and details of the minutes per week in which the student was involved in such activities was collected. The total weekly duration (in minutes) of 'vigorous' activities was multiplied by 8, and the total weekly duration (in minutes) of 'moderate' activities was multiplied by 4 to obtain the final MET (metabolic equivalent) score of the student. A MET score <600 was considered to be inadequate physical activity.[11]

All data was collected and electronically recorded. The data was analysed for significance using Chi-square test and Fischer's exact test between various groups of participants belonging to different stream of study and gender. Statistical software used was SPSS version 23.0. Values were expressed as Mean ± SD and p value <0.05 was considered as significant for all the tests applied.

RESULTS

The present study was conducted among the MBBS and BDS students. A total of 200 apparently healthy students, 100 from each group comprising of 50 males and 50 females, were randomly selected. The students were analyzed for distribution of age, weight and height. The Anthropometric data comparisons were also made using Pearson chi-square and Fisher exact test using SPSS 23.0. version. Table 1 shows that the mean age of the participants was 19.41±1.64 years (range 18-24 years; median age = 19 years).

Table 1: Anthropometric measurements of all participants

Parameter	**Mean** ± SD
Age (years)	19.41±1.64
Weight (Kgs)	61.88±1.64
Height (cms)	166.87±8.18

Values are expressed as mean ± SD.
Kgs= Kilograms
cms= centimetres

Table 2 shows that the age, weight and height of the MBBS and BDS students were statistically not significant.

Table 2: Comparison of anthropometric measurements between MBBS and BDS.

Parameters	**Stream (N=200)**	**Mean ± SD**	**P Value**
AGE	BDS	19.44 ± 1.68	0.797
	MBBS	19.38 ± 1.60	
WEIGHT	BDS	61.33 ± 6.94	0.281
	MBBS	62.43 ± 7.45	
HEIIGHT	BDS	166.03 ± 7.69	0.147
	MBBS	167.71 ± 8.59	

For comparison unpaired t-test was used.
P value <0.05 was considered significant.
N=Total no. of participants

Table 3 shows that BDS students had significantly higher cardiovascular risk factors than MBBS students such as hypertension (16%, p=0.04). Hypertension was significantly higher in male students (p<0.001). Females had significantly higher WC (24%, p=0.007) and WHR (60%, p=0.005) than males. There was no significant difference in Physical inactivity between MBBS and BDS students (p=0.103), but was significantly higher in female students than males (p<0.001).

Table 3: Comparison of Cardiovascular Risk Factors Between Bds And Mbbs Students, And Between Male And Female Students.

Risk Factors	Total (N=200) (%)	BDS Students (N=100) (%)	MBBS Students (N=100) (%)	P value	Males (N=100) (%)	Females (N=100) (%)	P value
Obese BMI	23(11.5%)	11(11%)	12(12%)	0.006*	08(8%)	15(15%)	0.119
Overweight BMI	40(20%)	29(29%)	11(11%)		17(17%)	23(23%)	
Normal BMI	137(68.5%)	60(60%)	77(77%)		75(75%)	62(62%)	
High risk WC (>85 cm for men, >80 cm for women)	34(17%)	17(17%)	17(17%)	0.1	10(10%)	24(24%)	0.007*
High risk WHR (>0.89 for men, >0.81 for women)	99(49.5%)	56(56%)	43(43%)	0.089	39(39%)	60(60%)	0.005*
Hypertension	22(11%)	16(16%)	06(6%)	0.04*	17(17%)	05(5%)	0.011*
Physical inactivity (<600 MET score)	130(65%)	71(71%)	59(59%)	0.103	46(46%)	84(84%)	<0.001*

BMI Body mass index: WC: waist circumference; WHR: waist-hip ratio; MET: metabolic equivalent
Values are expressed as percentage (%).
p value<0.05, statistically significant

Table 4 shows more MBBS students reported family history of hypertension (24/42, 57%), type 2 diabetes (39/73, 53.42%), and obesity (10/17, 58.82%) than BDS students. Only 3 participants gave history of smoking, and only 6 participants (4 in MBBS and 2 in BDS streams, and all were males) admitted to being affected by passive smoking.

Table 4: Characteristics of MBBS and BDS students.

S. No.	Characteristics	MBBS (%)	BDS (%)
1	Family History of Hypertension	24 (57%)	18 (43%)
2	Family History of Diabetes	39 (53.42%)	34 (46.58%)
3	Family history of Obesity	10 (58.82%)	7(41.18%)
4	Active Smokers	2(2%)	1(1%)
5	Passive Smokers	4(4%)	2(2%)

Data expressed in terms of percentage (%).

DISCUSSION

The present study was undertaken with the objectives of finding out the prevalence of various cardiovascular risk factors in a sample of BDS and MBBS belonging to the age group of 18-24 years in the GMC Srinagar. A total of 200 apparently healthy students (100 from each stream MBBS and BDS comprising of 50 males and females within each stream) were involved in the study. Though some studies in the past have evaluated the prevalence of CV risk factors in medical students in various regions of India, to our best knowledge no such study was carried out in this region so far.

We found that about 31.5% of participants had BMI of more than 23. Among which about 20% were overweight and 11.5% were obese. Though there were almost equal percentage of obese in both streams (11% and 12%) but we found more percentage of students overweight in the BDS (29%) than MBBS (11%) group and the difference was statistically significant (<0.05). Although more percentage of females than males were found to be obese or overweight (15% and 23% vs 8% and 17% respectively) but the difference was not statistically significant (P=0.119). In contrast, a study reported by Kurian S et al had found that significantly more male MBBS students were having a BMI of more than 25.[14]

Although we found no difference in high-risk waist circumference between BDS and MBBS students but more female students were classified under the high-risk waist circumference category than their counterparts and the difference was statistically significant (P<0.05). This observation is in harmony with the study by Kurian S et al who also reported that more female MBBS students belonged to a higher WC risk category.[14]

When WHR was taken as the parameter for assessing risk, we found that 49.5% of the participants were classified as having a high risk of developing cardiovascular diseases. Further, the incidence of high-risk WHR was significantly higher (P<0.05) among female students (60%) than their male counterpart (39%), and the risk was more in BDS students though the difference was not statistically significant. It has been reported that WC is more sensitive than WHR as an index of upper body adiposity[15] and that Asian Indians

have higher upper body adiposity and higher visceral fat for a given BMI than the Western population.[16]

With this background, our study revealed that in the selected population sample, female students, especially those studying BDS, have a higher degree adiposity and thus are at a higher cardiovascular risk than other subgroups. More male students were found to be having hypertension than females (17% vs 5%) and the BDS students had a higher prevalence of hypertension than the MBBS students ($P<0.05$). This result is similar to that reported in previous studies.[15]

Interestingly, while both BDS and MBBS studies can be considerably stressful, this finding needs to be confirmed by repeating a similar study with a higher sample size. It is also required to investigate the factors contributing to this high prevalence of hypertension in BDS students, and preventive and/or corrective actions are to be planned.

More male MBBS students gave significant family history of cardiovascular risk factors than other subgroups. This may be explained on the basis that medical students are more aware about the importance of risk factors, and how to look for them in their immediate surroundings.

We found that more female students had inadequate physical activity than male students. This finding was similar in both BDS and MBBS streams of study. Similar results have been reported in previous studies.[15, 17]

In our study only 3 out of the 200 students gave history of smoking, and only 6 students (4 in MBBS and 2 in BDS streams, and one all were males) admitted to being affected by passive smoking. There is a possibility of wilfully withholding information due to the stigma associated with smoking that cannot be ruled out confidently.

Studies similar to ours have been reported from outside India as well, with somewhat similar outcomes. Among third year medical students from Greece, male students had higher BMI (overweight and obese) than female students, and the presence of obesity was correlated to the presence of hypertension and dyslipidaemia.[7]

Limitations of the present study: include insufficient sample size and omission of risk factors such as glycaemic status, lipid profile, and diet. Further studies of longer duration and involving larger sample size will provide a more comprehensive outcome.

CONCLUSIONS

Prevalence of adolescent students having overweight and obese BMI according to Indian standards in the selected sample was 40% and 23% respectively. More female BDS students were classified under the high-risk WC category. Elevation of BP was more prevalent among male BDS students, and overall, more female students had inadequate physical activity than males. Proper education about cardiovascular risk factors and lifestyle modification is essential to reduce modifiable cardiovascular risk factors and thereby to postpone the development of cardiovascular diseases in this population, thus paving way for a healthier population. Further studies with larger population and inclusion of more risk factors are essential.

Conflict of interest

The authors declare that there was no conflict of interest.

Funding source

The authors declare that there was no funding source from any quarters. The authors contributed for the study.

Acknowledgement

The authors would like to thank all the students who participated in this study. Without their cooperation this work would not have been possible. Lastly authors are thankful to all the staff members of the Department of Physiology for their help in the data collection and compilation and provision of some valuable suggestions.

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