



STUDY OF CORONARY RISK FACTORS AMONG MEDICAL STUDENTS IN COASTAL CITY OF KARNATAKA

Nanjesh Kumar S¹, Sahul Hameed², Avin BR Alva¹, Diwaker Kumar Singh², Kurulkar P V³, Jayaram S³

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Author's Affiliation:

¹Assistant professor, Department of Community, Medicine, KS Hegde medical Academy, Mangalore; ²Assistant professor, Department of Community, Medicine, Srinivas Institute of medical sciences, Mangalore; ³Professor, Department of Community, Medicine, AJ Institute of medical sciences, Mangalore

Correspondence:

Nanjesh Kumar S
Email: drnanjesh@yahoo.co.in

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INTRODUCTION

Cardio vascular diseases (CVD) especially coronary heart disease (CHD), has assumed epidemic proportion in India.¹ CVD accounts for greater than 17 million deaths globally each year (30% of all deaths), 80% of which occur in low and middle income countries and this figure is expected to grow to 23.6 million by 2030.²

Indians have the highest mortality rates amongst all ethnic groups studied so far and it is a well-established fact that the South Asian population especially Indian sub-continent has higher risk and wider prevalence of CAD as compared to rest of

ABSTRACT

Background: Cardiovascular disease causes 29 per cent of all deaths globally each year. Lifestyle-related behavioural risk factors are mainly implicated for the increased burden of CHD, and research related to these risk factors among medical students is essential.

Objective: To identify coronary risk factors among medical students.

Methodology: A cross sectional study was done among M.B.B.S students of a Medical College from November 2012 to March 2014. The study comprised of 500 students. Data was collected by using pre-tested semi structured questionnaire which includes clinical examination and relevant laboratory investigations.

Results: Out of 500 subjects 276 were females and 224 were males. 367 (73.4%) subjects were consuming transfattyacid food items. 145 (29%) subjects were overweight and 29 (5.8%) subjects had Obesity. 76(15.2%) subjects had truncal obesity, 135 (27%) subjects were consuming alcohol and smoking was seen in 58 (11.6%) subjects. 90 (18%) subjects had lack of physical activity, 71 (14.2%) subjects had family history of CHD. 6 (1.2%) subjects had hypertension.

Conclusion: Modifiable cardiovascular risk factors are widely prevalent among medical students. Therefore promotion of supportive environment in the medical institutions for strengthening student based approaches and strategic delivery of periodic health education is essential

Keywords: Coronary, Cardiovascular, Risk factors, behaviour, lifestyle

ethnic groups.^{3,4} Deaths related to CAD have been found to occur 5 to 10 years earlier in Indian sub-continent than in Western countries.⁵

Few studies have been done recently to identify the temporal trends in the metabolic and demographic profile of CAD in young patients and mortality pattern in these patients.⁶⁻¹⁰ Though studies have been done in Indian setup analysing association of young CAD with Metabolic Syndrome¹¹, studies analysing temporal trends in Indian setup, where young CAD is highly prevalent are still lacking.

Coronary heart disease (CHD) risk in young adults aged 18-24 years is underestimated despite the

high prevalence of CHD risk factors¹²⁻¹⁴ and early signs of atherosclerosis in this age group.¹²⁻¹⁶ Obesity has more than doubled in children and more than tripled in adolescents over the past 30 years.¹⁷ This weight gain tracks forward and worsens in young adulthood.¹⁸ Heart disease risk increases by 2-4% for each year a young adult is obese.¹⁹ As many as 33% of young adults are overweight¹², and this excess weight leads to dyslipidaemia¹⁹ and increases risk of metabolic syndrome²⁰, diabetes²¹, and CHD¹³. More than half of young adults have at least 1 CHD risk factor, and this greatly increases lifetime heart disease risk.²² Many CHD risk factors surface in adolescence and track forward to adulthood.²³

The concept of risk factors identification and modification is based on the idea that, exposure to environmental factors increases the statistical risk for developing a disease and alteration of these factors should postpone or prevent the disease. Identification of risk factors operating in young age is important since correction of modifiable risk factors was found to be more yielding in this age group than in older patients.²⁴

MATERIALS AND METHODS

A cross sectional study was done among M.B.B.S students of a Medical College in Mangalore from November 2011 to March 2014. All the students who were admitted on or before 1/1/2010 at the Medical College in Mangalore were included in the study. The study comprised of 500 students.

Method of Collection of Data: Informed written consent was obtained by explaining to the subjects about the method of study and outcome. A pre-tested semi structured questionnaire was used for collection of data. Data was collected by interview cum, clinical examination and relevant laboratory investigations.

Method of study: Subjects were contacted as per their convenience. General information, Present,

Past, Personal & Family History were collected by asking relevant questions. Clinical Examination was done in the Out Patient Department of Community Medicine, running at the teaching hospital of the college. Height, body weight, waist circumference, hip circumference and blood pressure were measured using standard protocol.^{5, 6, 7} Statistical analysis was done using SPSS software version 16.

Inclusion Criteria: All the students of M.B. B.S. course were included (From 1st M.B. B.S to Internship) for the study.

Exclusion Criteria: a) Students with known history of cardiovascular disease or diabetes mellitus. b) All those who were not willing to participate.

RESULTS

The table-1 shows that 276 (55.2%) were females and 224 (44.8%) males. In sex composition apparently females were more in all the age groups except in age group of 24-25 and above 25 where males are more in number as compared to females. In this study, 404 (80.8%) subjects were Hindus followed by Christians 58 (11.6%), Muslims 35 (7%) and others (0.6%).

Table 1: Sociodemographic distribution of study subjects (n=500)

Variables	Males (n=224)(%)	Females (n=276)(%)	Total (n=500)(%)
Age group years			
18-19	33 (14.73)	68 (24.63)	101 (20.2)
20-21	97 (43.30)	125(45.28)	222(44.4)
22-23	57(25.44)	67((24.27)	124(24.8)
24-25	27(11.06)	12(04.34)	39(07.8)
Above 25	10(04.46)	4(01.44)	14(02.8)
Religion			
Hindu	184 (82.14)	220 (79.71)	404 (80.8)
Muslim	12 (05.35)	23 (08.33)	35 (07.0)
Christian	27 (12.05)	31 (11.23)	58 (11.6)
Others	1 (0.44)	2(0.72)	3 (0.6)

Table 2: Distribution of coronary risk factors in Study subjects in relation to their Sex (n=500)

Coronary risk factors	Males (n=224) (%)	Females (n=276) (%)	Total (n=500)(%)	Chi Square	P Value
Family history of CHD	31 (13.8)	40(14.49)	71(14.2)	0.043	0.470
Smoking	50 (22.32)	8 (02.89)	58(11.6)	61.903	0.0001
Alcohol consumption	103 (45.98)	32 (11.59)	135(27)	74.184	0.0001
Transfattyacid consumption	171 (76.33)	196 (71.01)	367(73.4)	1.796	0.108
Lack of Physical Activity	27(12.05)	63(22.82)	90(18.0)	9.722	0.001
Overweight(BMI 23-25kg/m ²)	74(33.03)	71(25.72)	145(29.0)	8.224	0.016
Obesity (BMI>_25 kg/m ²)	18(08.03)	11(03.98)	29(05.80)	8.21	0.016
Truncal Obesity	58(25.89)	18(06.52)	76(15.2)	35.99	0.0001
Hypertension	6 (02.67)	0 (0)	6 (1.2)	-	-

Table 3: Distribution of coronary risk factors in study subjects in relation to Academic year

Academic year (number)	Smoking (%)	Alcohol consumption (%)	Transfattyacid containing food consumption (%)	Sedentary Habits (%)	Truncal obesity (%)	Over weight BMI≥23(%)	Obesity BMI≥25 (%)
1 st year (100)	3(3)	16(16)	66 (66)	8(8)	11(11)	25(25)	4(4)
2 nd year(117)	12(10.25)	19(16.23)	86(73.50)	23(19.65)	14(11.96)	29(24.78)	4(3.41)
3 rd year(91)	13(14.28)	27(29.67)	68(74.74)	13(14.28)	11(12.08)	22(24.17)	5(5.49)
4 th year(93)	16(17.20)	28(30.10)	70(75.26)	34(36.55)	20(21.50)	31(33.33)	9(9.67)
Intern(99)	14(14.14)	45(45.45)	77(77.77)	12(12.12)	20(20.20)	38(38.38)	7(7.07)
Total (500)	58(11.6)	135(27)	367(73.4)	90(18)	76(15.2)	145(29)	29(5.8)
Chi square	11.531	30.904	12.623	31.864	10.640	10.19	14.35
P value	<0.021	<0.0001	<0.013	<0.0001	<0.031	<0.001	<0.07

The table-2 shows that 71 (14.2%) subjects had family history of CHD. In this, 31 subjects were males and 40 subjects were females. 58 (11.6%) subjects were smokers. Majority smokers were males (22.32%) as compared to females (2.89%). Alcohol consumption was seen in 135 (27%) of the subjects. Majority were males (103) and 32 subjects were females. Transfattyacid containing food consumption among study subjects was very high-367 (73.4%). Consumption among males was 76.33% and in females 71.01%. Lack of physical activity was reported in 90 subjects, which was higher among females (22.83%) than males (12.05%). Overweight was seen in 145 subjects. Among them was 33.03% males and 25.72% females. Obesity was seen in 5.8% of the subjects. Among males it was 8.03% and females 3.98%. Truncal obesity was seen in 15.2% subjects, among males 25.89% and females 6.52%. 6(1.2%) subjects were having high blood pressure ($\geq 140/90$ mmHg). All these subjects were males.

The difference between males and females was significant ($p < 0.05$) in the following coronary risk factors: smoking, alcohol consumption, lack of physical activity, overweight and truncal obesity.

In the table-3 the prevalence of smoking was high among the 4th year (17.20%) subjects followed by the 3rd year (14.28%) subjects. Alcohol consumption was high among the intern (45.45%) followed by 4th year (30.10%) subjects. The consumption of transfattyacid is more in the interns (77.77%) followed by the 4th year subjects (75.26%) and least among the 1st year subjects (66.0 %). The lack of physical activity was reported in the 18% of subjects. It was more among the 4th year subjects (36.55%) followed by 2nd year subjects (19.65%). The proportion of truncal obesity was more in the 4th year subjects (21.50%) followed by the interns (20.20%). Overweight was high among the interns (38.38%) followed by the 4th year subjects (33.33%). Obesity was more in the 4th year subjects (9.67 %) followed by the interns (7.07%). The difference between the above coronary risk factors in relation to academic year was statistically significant ($p < 0.05$).

DISCUSSION

In the present study, among the 500 study subjects, 224 were males and 276 were females. The mean age of the study subjects was 21 years and youngest subject was 18 years, oldest was 29 years. In the study population 117(23.4%) subjects belonged to 2nd year followed by 100 (20%) subjects belongs to 1st year. In the study subjects, 80.8% were Hindus followed by Christians (11.6%), Muslims (7%) and Others (0.6%).

In the present study, 71 (14.2%) subjects had family history of CHD (non modifiable risk factor), of which 31 (13.8%) subjects were males and 40 (14.49%) subjects were females. 58 (11.6%) subjects were smokers. Majority smokers were males 50(22.32%) and 8(2.89%) were females. The difference between males and females was statistically significant ($p < 0.0001$). Alcohol consumption was seen in 135 (27%) of the subjects. Majority were males 103(45.98) and 32 (11.59%) were females. This difference between males and females was statistically significant ($p < 0.0001$). Among the study subjects those consuming food items containing transfattyacid was very high 367 (73.4%). The lack of physical activity was reported in 90 (18%) subjects, which was higher among females 22.83% and males in only 12.05%. The same is statistically significant (p value 0.001).

Overweight was seen in 145 (29%) subjects. Among them, males were 33.03% and females were 25.72%. Obesity was seen in 5.8% of the subjects. Among them, males were 8.03% and females were 3.98%. The prevalence of overweight was significantly higher in males as compared to females ($p < 0.016$). Truncal obesity was seen in 76 (15.2%) subjects. Among them, males were 58 (25.89%) and females were 18 (6.52%). The significant difference was because most of all female subjects in this age were beauty conscious and they eat less as compared to male subjects to maintain their body shape. This difference between male and female was statistically significant ($p < 0.001$)

6(1.2%) subjects were having high blood pressure ($\geq 140/90$ mmHg). All these subjects were males

and high blood pressure (BP) was not seen in females. Two subjects out of six were already on antihypertensive drugs. During this study we found four subjects having high BP and at present they are on dietary control. The blood pressure tracking should be done in these subjects.

Latheef SA and Subramanyam G²⁵, in their study, overall prevalence in the study population was 12.63 (192 cases). In males it was 6.86 (37 cases) and in females 15.81 (155 cases). Prevalence of coronary risk factors at the age groups 20-30 years in males and females for smoking/tobacco 22.77%, 0.69%, hypertension 8.9%, 7.69%, obesity 30.69%, 26.22%, central obesity 51.48%, 70.27%, family history of CAD 1.98, 3.84.

Rajeev Gupta et al¹ did a study in north India in 1999-2002 and evaluated major coronary risk factors in 2051 subjects aged 15-39 years of age. They found that at age 15-19 years, the prevalence (%) of coronary risk factors in males and females, respectively, was overweight/obesity in 7.6, 8.8; high WHR 4.9, 14.4; hypertension 2.3, 0.3. In age groups 20-29 years in males and females, ORs were, for smoking 5.3, 1.0; obesity 1.6, 0.8; truncal obesity 4.5, 3.1; hypertension 2.6, 4.8; ($p < 0.05$ for some).

In the present study, the prevalence of smoking was high among the 4th year (17.20%) subjects followed by the 3rd year (14.28%) subjects, possibly due to enhanced academic stress. This difference in the smoking in relation to academic year was statistically significant ($p < 0.021$).

Alcohol consumption was high among intern (45.45%) followed by 4th year (30.10%) subjects. The proportion of consumption of alcohol significantly increased ($p < 0.0001$) with increase in the academic year. In internship, subjects get more occasions for celebration like birthday, completion of posting and engagement of friends etc. They feel this being their last year to be away from home and hence possibly they want to enjoy the last year with their friends/peer group.

The consumption of fast food like cakes, deep fried food, chips, containing more transfattyacid is more in the interns (77.77%) followed by the 4th year subjects (75.26%) and least among the 1st year subjects (66.0%). This difference in the consumption of transfattyacid in relation to progress in the academic year of the subjects was significant ($p < 0.013$). The consumption of transfattyacid is least among 1st year subjects due to majority of the students were new to the college and the place and as they progress in the college their habit of eating out side like from hotels, pizza corners, fast food shops, increases significantly because they come to know the place very well and their friends circles also increase the tendency to go outside for food.

The lack of physical activity was reported in the 18% of subjects. It was more among the 4th year subjects (36.55%) followed by 2nd year subjects (19.65%). This was possibly because the subjects in 4th year and 2nd year found less time for playing games due to academic compulsion. However, 1st year fresher's, in spite of academic stress, they may be carrying out physical exercise due to their exposure first to professional college atmosphere. This difference in the lack of physical activity in the subjects in relation to academic year of the subjects was statistically very highly significant ($p < 0.0001$).

Rustagi N et al²⁶ did a study on cardiovascular risk behaviour among students of a Medical College in Delhi in November 2009 to February 2010. They found that use of any form of tobacco was 7%. Use of tobacco was significantly increased with increase in semester of the students, in 1st semester 1.2%, 3rd semester 11.9%, 5th semester 12.6%, 7th semester 17.0% and 9th semester 31.3%. In this study also, smoking of tobacco was increased with increase in the academic year of the subjects. Use of alcohol was 28.8%. Use of alcohol was significantly increased with increase in semester of the students, in 1st semester 10.7, 3rd semester 16.7%, 5th semester 27.6%, 7th semester 34.1% and 9th semester 56.3%. In this study, alcohol consumption was increased with increase in the academic year of the subjects. The consumption of fast food was 32.0%. Consumption fast food was significantly increased with increase in semester of the students, in 1st semester 23.8%, 3rd semester 26.7%, 5th semester 37.5%, 7th semester 37.1%, and 9th semester 34.9%. The lack physical activity was reported in 42.6% students. Lack physical activity was significantly increased with increase in the semester of the students, in 1st semester 15.5, 3rd semester 16.3%, 5th semester 27.3%, 7th semester 37.2%, and 9th semester 31.7% respectively.

In the present study the proportion of truncal obesity was more in the 4th year subjects (21.50%) followed by the interns (20.20%). The truncal obesity was increased with increase in the academic year of subjects and the same is statistically significant ($p < 0.031$). Overweight was high among the interns (38.38%) followed by the 4th year subjects (33.33%). Obesity was more in the 4th year subjects (9.67%) followed by the interns (7.07%). The proportion of overweight and obesity increased with increase in the academic year of the subjects. This was mainly because the lack physical activity, consumption of transfattyacid containing food, consumption of alcohol also increased with increase in the academic year of the subjects. The difference in the overweight and obesity in relation to academic year of the subjects was statistically significant.

CONCLUSION

From this study, it is inferred that modifiable cardiovascular risk factors are widely prevalent among medical students which increases with years spent in the medical college. The findings are rather alarming. Therefore promotion of supportive environment in the medical institutions for strengthening student based approaches and strategic delivery of periodic health education and health status monitoring is essential to decrease the modifiable coronary risk factors among our future doctors. They should be encouraged to adopt healthy life style practices at this younger age so that it continues throughout their life.

Limitation: Few subjects, in spite of persuasion, had not revealed their personal history regarding the alcohol consumption and tobacco smoking.

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