VOLUME-8, ISSUE-2, FEBRUARY-2019 • PRINT ISSN No 2277 - 8160

Original Research Paper

General Surgery

CARDIAC RISKS EVALUATION IN YOUNG MALE STUDENTS PURSUING PROFESSIONAL COURSES: URBAN VS RURAL STUDENTS (18-25 YEARS)

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ABSTRACT Hypertension is an important worldwide public health challenge. Various anthropometric indices like BMI, WHR, and WHtR have been found to be predictors for many diseases like hypertension, diabetes, coronary artery diseases. Present study was done on 200 male professional students belonging to rural and urban areas of Haryana and Punjab. Subjects were classified according to indices and blood pressure as per latest guidelines. Prevalence of deranged parameters were more in urban subjects. Prevalence of medium level of stress and pre hypertension was more in rural students. High fat and salt intake, sedentary life style, genetic associations were positively associated with high blood pressure among urban professional students. Whereas history of smoking, and stress levels were higher in all the rural professional students. Male professional urban students having more risk of CVD. While rural students are more exposed to less sleep, raised stress level, increased smoking lead to pre hypertensive condition which is one of the predisposing factor of CVD.

KEYWORDS : Cardiac risk, Professional, Life style, Stress, Hypertension, Urban, Rural

INTRODUCTION

Urbanization and technological advances have led to dramatic changes in the life style of many Indians who are embracing a modern and often mare sedentary daily life. Professional students due to highly competitive and demanding academic environment are more prone to lifestyle related risks.

Cardiovascular diseases caused 2.3 million deaths in India in the year 1990; this is projected to be double by the year 2020 Gupta R (2003). Coronary artery disease (CAD) is highly prevalent in India and affects Indians at much younger age with higher morbidity and mortality Gupta R (2008). India has also been predicted to be the world capital of coronary artery disease by 2020 Enas EA (2005).

A number of environmental and genetic factors are associated with cardiac diseases such as age, sex, body size, obesity, change in dietary habits and family history of hypertension, lack of physical activity, increased stress Durrani AM (2011). Prevalence of hypertension has increased by 30 times among the urban population over period of 55 years and about 10 times among rural population over a period of 36 years. Rising affluences has modified the dietary pattern characterized by increased consumption of diet rich in fat, sugar and calories Rahim MA (2012). Stress has been implicated as a risk factor for cardiovascular disease as it may contribute to changes in dietary behaviors that lead to weight change Block JP (2009). Since all these factors are preventable, therefore it is important to identify young population at risk and to just educating them about healthy lifestyle.

Anthropometric indices such as body mass index (BMI), waist circumference (WC) waist hip Ratio (WHR) & waist height ratio (WHtR), lifestyle related risk factors: dietary habits and physical activity and family history can predict future cardiac risk. Hence these parameters were used in this study to predict the future cardiac risks among male students of urban and rural areas pursuing professional courses. The data can be helpful in applying preventive strategies for cardiac disease risk at an early stage.

MATERIALS AND METHODS

A cross sectional survey was done on randomly selected 200 young males (100 rural and 100 urban) pursuing professional courses of age group 18-25 years belonging to rural and urban areas in Haryana and Punjab region. Prior informed written consent for this study was obtained from the subjects, both in English and vernacular. Inclusion and exclusion criteria were predefined. Male students age below 18 years and above 25 years, Wheel chair bound or having difficulty in standing and the subjects already diagnosed having heart disease, chronic diseases of major organ and endocrine disorders were excluded from the study. Personal history, dietary history and family history of subjects were taken**.** History pertaining to stress was taken according to pre validated questionnaire**.** Body weight (Kg) was measured by making a person to stand on weighing scale of sensitivity and specificity with light clothes and without shoes. Height was the measurement of maximum distance from floor to the highest point on head, when the subjects were facing directly ahead and with shoes removed, feet together and arms by sides. Waist circumference (WC) in cm. The non elastic flexible metallic tape was applied horizontally midway between the lowest rib margin and the iliac crest. Hip circumference (HC) in cm was taken over minimal clothing, at the level of greatest protrusion of gluteal (buttocks) muscles. Pulse rate was taken by feeling Radial pulse and counted at wrist for 1 minute. Blood pressure (BP) was measured by using a mercury sphygmomanometer.

Three readings were taken 5 minute apart and the average of three readings taken Das SK (2005). Subjects were classified according to the latest guidelines based on JNC-VII Criteria as per following details.

Normal: Systolic and diastolic < 120/80 mm of Hg. Prehypertensive : 120-139/ 80-89 mm of Hg

Stage-I Hypertensive: 140-159/90-99 mm of Hg, Stage-2 Hypertensive : Systolic 160 mm of Hg or diastolic 100 mm of Hg.

INDICES:

After taking all parameters indices were calculated. Body mass index (BMI) is Weight(Kg)/ Height(m^2) Patil SP (2012); Snehalatha C (2003). Normal - 18.50 – 22.99 kg/m^2, Over weight - 23.00 – 24.99 kg/m^2, Obesity - ≥ 25.00 kg/m. Waist Hip Ratio (WHR) is Waist circumference(cm)/ hip Circumference (cm) Snehalatha C (2003). Normal - <0.89 cm, High WHR - ≥ 0.89 cm, Waist- Height Ratio (WHtR) is Waist circumference (cm)/ Height (m) Deshmukh PR (2006). Normal - < 0.5, High - ≥ 0.5

STATISTICAL ANALYSIS

The measurements were statistically analyzed (arithmetic mean and standard deviation were calculated) and tabulated. Mean, S.D. and student T test were used to compare quantitative data. Frequencies

and Chi square tests were used to compare qualitative data and adjusted odds ratio were calculated for risk factors for CVD.

ETHICAL JUSTIFICATION

Only subjects who volunteered to participate in the study, after informed written consent both in English and in vernacular were taken and the data kept confidential. Study had not caused any financial burden on the subjects and the institute, therefore the study was ethically justified.

RESULTS AND DISCUSSION

Table 1. Mean Values Of Quantitative Data Of Urban And Rural Students

Variables	Urban students (n=100) Mean ± SD	Rural students (n=100) Mean ± SD	P value
Height (m)	1.73± 0.05	1.75± 0.06	0.01
Weight (Kg)	71.0 ± 12.43	71.0 ± 12.88	1.00
Pulse rate (per min.)	74.00 ± 6.19	77.00 ± 6.5	0.001
SBP	126 ± 11.26	110 ± 10.54	0.001
DBP	84 ± 8.06	78 ± 8.57	0.001
BMI	25.59 ± 3.91	23.24 ± 3.72	0.001
WC	87 ± 9.73	82 ± 8.74	0.001
HP	94 ± 7.82	93 ± 7.27	0.3
WHR	0.89 ± 0.04	0.86 ± 0.05	0.001
WHtR	0.47 ± 0.055	0.46 ± 0.04	0.11

P value ≤ 0.05 is considered significant

Table 2. Percentage Of Students Showing Deranged Anthropo metric Indices & Blood Pressure

Variables	Urban students (%)	Rural students(%)	Chi square value	P value	Odd's ratio
obesity	43	32	2.13	0.14	1.60
overweight	25	17	1.48	0.22	1.62
High WC	54	43	2.00	0.15	1.56
High WHR	79	68	2.56	0.11	1.77
High WHtR	36	21	4.81	0.02*	2.11
Systolic BP	62	48	3.41	0.04*	1.77
Diastolic BP	49	38	2.03	0.15	1.57

P value ≤ 0.05 is considered significant

Table 3 – Correlation Coefficient Of Anthropometric Variables With Blood Pressure Among Professional Students Of Urban And Rural Areas

Anthropometric variables	SBP (r value)		DBP (r value)	
	PU	PR	PU	PR
BMI	0.493**	0.269**	0.407	0.2444*
WC	0.4893**	0.2751*	0.3861	0.2634
WHR	0.3552**	0.1998*	0.2856**	0.1928**
WHtR	0.4929**	0.2125*	0.3976	0.2147*

Average height and pulse rate were significantly higher in rural professional male students. On the other hand SBP, DBP, BMI, WC, WHR were significantly higher in urban professional male students (Table 1).

On comparing urban students with rural students we found more number of urban students have high BMI, high WC, high WHR. Significant difference was found in high WHtR and systolic BP (Table 2). Odd's ratio depicted CVD risk factor was more in urban students (Table 2).

Diet of subjects among both groups was containing lower amount of fibers, whole grain and nuts. Junk food intake (high fat and high salt) was significantly higher (<0.0001) in Rural students. Night sleep less than 7 hours and low physical activity was observed in higher number of rural male students but the difference was not significant (p value is 0.37 and 0.18 respectively). Current smoking level was higher in rural students. On the other hand alcohol intake was higher in urban students. Positive family history was significantly (<0.01) higher among urban students.

Medium stress was seen significantly more in Rural subjects pursuing professional courses (p value=0.001) (Fig 1). Positive correlation of BMI, WC, WHR and WHtR with SBP was observed and it was found to be highly significant (Table 3). Positive correlation of BMI and WHtR with DBP was observed in Professional students of rural areas. Significant Positive correlation of WHR was found with DBP in both professional students of rural as well as urban areas.

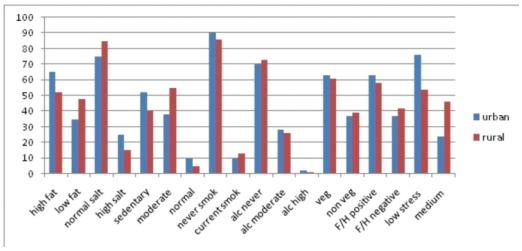

Fig. 1 – Comparison of life style of Urban and Rural Professional students

Lifestyle diseases like Hypertension, Diabetes mellitus and overweight/obesity are the major risk factors for development of CVD. With rapid economic development and increasing westernization of lifestyle in the past few decades prevalence of these diseases has reached alarming proportions among Indian in recent years Pappachan MJ (2011). The large segment of young population is at risk, which is still undiagnosed. Professional young students are usually exposed to more stressful and faulty life style which may lead to early progression of disease. Significant difference in the life style was observed among the two groups which was also associated with significant difference in anthropometric parameters. Surprisingly the urban professional students were significantly consuming more junk food (Fig. 1). Perhaps due to lack of time and availability of junk food in urban area and urban people are used to having junk food. Rural people are less used to having junk food because it hardly available in rural area.

Night sleep < 7 hours and medium level stress was more prevalent in professional students belonging to rural area. This was probably rural students have to work hard to cope up with studies. There are less facilities available for education.

Sedentary life style was seen in urban males. Because they usually do less physical activity as compared to rural males. Rural males have been protected due to their higher activity levels and lower body mass indices. So, modifiable risk factors were more prevalent in urban males. This coincides with the study done by Compos H et al (1992).

Rural male students smoked more cigarette per day than urban. It may be due to awareness of urban students against bad effects of smoking as compared to rural students. While there was greater indulgence of urban male students in consumption of alcohol. Surprisingly rural professional students consuming more non veg food. It was reported previously that non vegetarian had a high prevalence of CVD Agarwal AK (1996). SBP and DBP are significantly high in urban students. It may be due to intake of more junk food and sedentary life style. Significant difference in the life style were observed among two groups which was associated with significant difference in anthropometric parameters. The deranged anthropometric indices BMI, WC, WHR, WHtR were significantly higher in urban professional students which leads to central obesity which would make them more prone to cardiac risk. On the other hand increased prevalence of stress, more exposed to less sleep, leads to increased prevalence of pre hypertension in rural professional students. This is coincided with previous study done by

Agarwal AK (1996), Methews JD (1968). So, prevalence of CVD risk factors is gradually increasing in urban male professional students.

CONCLUSION

It is concluded that male professional urban students are more likely to consume junk food, more alcohol, sedentary life style, positive family history of hypertension, increased systolic and diastolic blood pressure, raised BMI, WC, WHR and WHtR to trunkal obesity and more risk of CVD. While rural students are lack of proper night sleep, raised stress level, increased smoking lead to pre hypertensive condition which is one of the predisposing factor of CVD. So, rural students pursuing professional courses have also tendency for CVD but less than urban students.

Therefore, it is suggested that counseling session for students regarding healthy diet, good physical activity, harmful effects of smoking and stress management should be carried out routinely in college campus. Anthropometric indices and pre-hypertension should be taken as indicators for the imparting hypertension.

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