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Risk Factors among Adolescents of Urban Field Practicing Area of MIMS Medical College, Vizianagaram

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The risk factors associated with cardio-vascular diseases are divided into modifiable and non-modifiable.

The modifiable risk factors include - hypertension, abnormal blood lipid levels, tobacco (smoking or chewing), passive smoking, physical inactivity, obesity, type 2 diabetes, diet high in saturated fat, alcohol, chronically stressful life, social isolation, anxiety and depression, contraceptive pill and Hormone Replacement Therapy (HRT), Left Ventricular Hypertrophy (LVH).

The non-modifiable risk factors associated are Old age, first-degree blood relative having CVD, Male gender and African or Asian ancestry [4].

Most cardiovascular diseases can be prevented by addressing behavioural risk factors such as tobacco use, unhealthy diet and obesity, physical inactivity and harmful use of alcohol using population-wide strategies [1].

Aims and Objectives

1. To study the demographic profile of study population.

2. To determine the prevalence of cardio-vascular disease risk factors among study population.

3. To suggest measures for prevention of cardio-vascular diseases.

Material and Methods

Type of Study

Community based cross-sectional study.

Study Period

June 2017 to July 2017.

Study Population

Adolescents of the age group 10 to 19 years.

Sample Size

The study was conducted in the Urban Field Practice area of MIMS Medical College. The field practice area covers a population of 16,030 having 8,045 males and 7,985 females. Population in the age group 10 – 19 years constitutes 3,284. The study area is divided into four Bits and from each Bit 10% of the population in the age group 10 to 19 years was covered. So the total study sample was 10% of 3284, i.e. 328. Simple random sampling was done by using the list registered with the AWC. Participants were approached on holidays and if a person was absent he/she was covered on next visit. The person in next house was covered if one person found absent for two visits. Adolescents who have given the written consent were included in the study.

Data Collection Procedures & Instruments

Data was collected in a predesigned and pretested schedule having two sections, containing demographic data such as name, age, sex and qualification in the first section and risk factors such as blood pressure, BMI, Waist-hip ratio, smoking habit, history of alcohol intake, dietary history, history of junk food intake, salt intake, physical exercise history in the second section.

Quality Control

Blood pressure was recorded in the right arm with the subject in a seated position using a mercury sphygmomanometer. Average of two readings; first reading after at least 15 min of rest and the second reading 15 min after the first reading was taken as blood pressure [5]. Hypertension has been defined as SBP or DBP > 95th percentile for 10 to 17 years and SBP ≥ 140 mmHg or a DBP ≥ 90 mmHg for 18 to 19 years. Prehypertension for 10 to 17 years as SBP or DBP reading < 90th percentile to 95th percentile, and for 18 to 19 years, SBP ≥ 120 mm Hg to ≤ 139 mmHg or a DBP ≥ 80 mm Hg to ≤ 89mm Hg. Normal Blood pressure was taken as SBP or DBP reading upto 50th percentile for 10 to 17 years and for 18 to 19 years SBP ≤ 120 mmHg or a DBP ≤ 80 mm Hg [6].

Weight was registered using an electronic weighing machine and was rounded off to the nearest 0.5 kg. For measuring height, the subject was made to stand erect looking straight on a level surface and height was read to the nearest 0.5 cm [5]. Adolescents were classified as being overweight or obese according to Centers for Disease Control age- and gender-specific percentiles for BMI [7]. Overweight was defined as having a BMI percentile of ≥ 85th and < 95th percentile, and obesity was defined as being ≥ 95th percentile. Normal weight was defined as a BMI percentile ≥ 5th to < 85th percentile and Underweight as BMI < 5th percentile [8].

For waist-hip ratio, waist circumference was measured at the approximate midpoint between the lower margin of the last palpable rib and the top of the iliac crest and hip circumference measurement

around the widest portion of the buttocks in standing position. Waist-hip ratio > 0.9 in males and > 0.85 in females was taken as abnormal [9].

Junk food was defined as those food items containing high levels of calories from sugar or fat with little protein, vitamins, or minerals such as packed chips and cola. Extra salt intake defined as the consumption of two or more pinches of salt per meal excluding the previously added salt during preparation or use of salted pickle with most meals. A daily smoker was defined as a person who smoked tobacco products in any form on all the days. History of alcohol consumption in any form in the past 30 days was recorded [5]. Regular physical exercise was defined as aerobic physical activity such as brisk walking for at least 30 min per day. No exercise was defined as no aerobic physical activity and some exercise was defined as aerobic physical exercise on some days of the week [5].

Analysis

Data entry and analysis were done on SPSS version 17.

Ethical Considerations

Ethical clearance for the study was obtained from Institutional Ethical Committee, MIMS Medical College, Vizianagaram. Written consent was obtained from the participants more than 18 years and in case of minor written consent was taken from both the participant and guardian.

Results

In this study, data was collected from 328 adolescents. Out of 328 participants, 185 (56.4%) were male and rest 143 (43.6%) were female. Mean age for male participants was 14.45 (±2.391) years and for females 13.73 (±2.507) years.

Out of the 328 adolescents measured for blood pressure, 12 (3.6%) were hypertensive, out of them 5 were male and 7 were female. 31 (9.5%) adolescents were having the blood pressure in the pre hypertensive range and rest i.e. 285 (86.9%) were normotensive. (Table 1).

Categorization of study participants in accordance with the BMI calculation represents that, 22 (6.7%) were Obese, 48 (14.6%) were overweight, 182 (55.5%) were in normal range. Rest of the 76 (23.2%) participants, were having BMI less than 5th percentile. (Table 1).

Waist to hip ratio possesses a significant risk if it is more than 0.9 in males and more than 0.85 in females. In this study, 32 (17.3%) of the male participants were found to possess waist to hip ratio more than 0.9 and 39 (27.3%) female participants were having waist to hip ratio more than 0.85. (Table 1).

Tobacco intake in any form (chewing or smoking) was present in 11.9% of the male participants but the habit was not found in any female participants. Though none of the participants were having history of daily smoking of tobacco, but passive smoking (any of the family members smoking in home) was present in 47% of the male participants and 29.4% of female participants. Alcohol intake in last 30 days was present in 4.3% of male participants but it was not observed in female participants. Junk food intake more than 3 times per week was found to be present in 56.2% males and 43.4% females. Similarly extra salt intake in the form of salad or other form was present in most of the participants (91.4% male and 92.3% female). (Table 2).

Table 1: Sex wise distribution of blood pressure, BMI and Waist-hip ratio

Parameters	Male (185)	Female (143)	Total (328)
Blood Pressure			
Hypertensive	5 (2.7%)	7 (4.9%)	12 (3.6%)
Prehypertensive	17 (9.2%)	14 (9.8%)	31 (9.5%)
Normotensive	163 (88.1%)	122 (85.3%)	285 (86.9%)
BMI			
Obese	9 (4.9%)	13 (9.1%)	22 (6.7%)
Overweight	22 (11.9%)	26 (18.2%)	48 (14.6%)
Normal weight	107 (57.8%)	75 (52.4%)	182 (55.5%)
Underweight	47 (25.4%)	29 (20.3%)	76 (23.2%)
Waist-hip ratio (p < 0.05)			
≤ 0.9 in Male or ≤ 0.85 in Female	153 (82.7%)	104 (72.7%)	257 (78.4%)
> 0.9 in Male or > 0.85 in Female	32 (17.3%)	39 (27.3%)	71 (21.6%)

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Table 2: Prevalence of other CVD risk factors in participants

Variable	Male (185)	Female (143)	Total (328)
Tobacco intake (p < 0.05)			
Present	22 (11.9%)	Nil (0.0%)	22 (6.7%)
Absent	163 (88.1%)	143 (100%)	306 (93.3%)
Daily smoking			
Present	Nil (0.0%)	Nil (0.0%)	Nil (0.0%)
Absent	185 (100%)	143 (100%)	328 (100%)
Passive smoking (p < 0.05)			
Present	87 (47.0%)	42 (29.4%)	129 (39.3%)
Absent	98 (53.0%)	101 (70.6%)	199 (60.7%)
Alcohol intake in last 30 days (p < 0.05)			
Present	8 (4.3%)	Nil (0.0%)	8 (2.4%)
Absent	177 (95.7%)	143 (100%)	320 (97.6%)
Junk food intake (p < 0.05)			
> 3 times per week	104 (56.2%)	62 (43.4%)	166 (50.6%)
≤ 3 times per week	81 (43.8%)	81 (56.6%)	162 (49.4%)
Extra salt intake			
Present	169 (91.4%)	132 (92.3%)	301 (91.8%)
Absent	16 (18.6%)	11 (7.7%)	27 (8.2%)

A total of 230 (70.1%) study participants were doing daily exercise for at least 30 minutes every day, among them 139 (60.4%) were males and 91 (39.6%) were females. Exercise for at least 30 minutes for some days in a week was done by 44 (13.4%) participants. Whereas, 54 (16.5%) participants were not exercising for at least 30 minutes even few days in a week (Table 3).

Adolescents having first degree relatives with Diabetes or Hypertension possess a greater risk of developing CVD in later life. In this study, 124 (37.8%) participants had first degree relatives with Diabetes or Hypertension or both. Out of this 124 participants, 79 (63.7%) were male and 45 (36.3%) were female (Table 4).

Table 3: History of physical activity among study participants

Exercise for at least 30 minutes (p < 0.05)	Male (185)	Female (143)	Total (328)
Daily	139 (75.1%)	91 (63.6%)	230 (70.1%)
Some days	26 (14.1%)	18 (12.6%)	44 (13.4%)
No exercise	20 (10.8%)	34 (23.8%)	54 (16.5%)

Table 4: History of Diabetes or Hypertension among first degree relatives of the study participants.

First degree relative having Diabetes or Hypertension	Male (185)	Female (143)	Total (328)
Present	79 (42.7%)	45 (31.5%)	124 (37.8%)
Absent	106 (57.3%)	98 (68.5%)	204 (62.2%)

Discussion

In this study out of 328 participants, 56.4% were males and 43.6% were females. Similarly in a study by S Kaur in Punjab majority of adolescent were male 52% and 48% were females [10].

Mean age for male and female participants were 14.45 and 13.73 years respectively. E Gupta et al. in their study found the mean age of boys and girls was 14.41 and 13.93 years respectively which is in accordance to the present study [11].

Out of the 328 adolescents measured for blood pressure, 12 (3.6%) were hypertensive, out of them 5 were male and 7 were female. IM Ismile et al in their study found that a total of 10 out of the 634 students were hypertensive which comes as 1.6% [5].

Body Mass Index value of the study participants reveals that , 22 (6.7%) were Obese and 48 (14.6%) were overweight. However, IM Ismile et al in their

study found that 1.6% and 8.2% study population were obese and overweight respectively [5].

In this study 32 (17.3%) male participants were found to possess waist to hip ratio more than 0.9 and 39 (27.3%) female participants had waist to hip ratio more than 0.85. But waist hip ratio was found to be significantly higher among boys than girls in the study by E Gupta et al [11].

Tobacco intake in any form was present in 11.9% of the male participants but it was absent in female participants. Daily smoking of tobacco was not found among the study participants. But passive smoking was present in 47% of the male participants and 29.4% of female participants. Whereas, IM Ismile et al. found that the prevalence of daily smokers were 2.4% in their study [5].

Alcohol intake in last 30 days was present in 2.4% of study participants, which is in accordance to the finding by IM Ismile et al (alcohol consumption in the past 30 days 2.5%) [5].

Junk food intake more than 3 times per week was found to be present in 56.2% males and 43.4% females. Similarly extra salt intake in the form of salad or other form was present in most of the participants (91.4% male and 92.3% female). Similarly, the study conducted by IM Ismile et al represents the prevalence of junk food intake more than 3 times per week was 65.9% and extra salt intake 78.5% [5].

In the present study, a total of 54 (16.5%) participants were not practicing adequate physical activity (for at least 30 minutes even few days in a week). On the other hand, the study by AK Singh et al found that 54.4% of the boys and 69.3% of girls did not engage in sports at school or at home [12].

As interviewed, first degree relatives of 124 (37.8%) participants were having Diabetes or Hypertension or both. Out of 124 participants, 79 (24.1%) were males and 45 (13.7%) females. Whereas, AK Singh et al in their study found that 50.5% of boys and 48.5% of girls had a family history of hypertension and 22.9% boys and 29.9% girls had a family history of obesity [12].

Conclusion and Recommendation

From this study it is evident that many CVD risk factors are prevalent in the adolescents of the study area which can be prevented by healthy lifestyles such as healthy diet, regular physical exercise and self awareness.

All non-smokers should be encouraged not to start smoking. Simultaneously any form of tobacco users should be advised to quit tobacco usage. Passive smoking must be avoided by proper counselling of household members. Alcoholics ought to be advised to reduce alcohol consumption through health education and behaviour change communication.

All individuals from very childhood should be persuaded to reduce total fat and saturated fat intake, along with limitation of salt intake to <5 gm/ day. Substantial amount (400gm/day) of fruits and vegetables should be promoted as part of dietary modification.

Moderate physical activity (e.g. brisk walking) of at least 30 minutes a day, outdoor game and other work-related physical activity should be promoted. Overweight or obese persons should be encouraged to lose weight through a combination of reduced-energy diet and increased physical activity.

Acknowledgement

Conflict of Interest

There is no conflicts of interest.

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