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Research Paper

# Prevalence of Behavioural Risk Factors of Cardiovascular Diseases Among High School Students in Urban Dibrugarh, Assam

Medical Science

**KEYWORDS** : Risk factor, cardiovascular disease, adolescents, hypertension, tobacco use

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| **Dr. Ekta Gupta** | Post – graduate trainee, Community Medicine Assam Medical College and Hospital, Dibrugarh, Assam – 786002 |
| **Dr. Tulika Goswami Mahanta** | Associate Professor, Community Medicine Assam Medical College and Hospital, Dibrugarh, Assam – 786002 |
| **Dr. Ratna Sarma** | Professor and Head, Community medicine Assam Medical College and Hospital, Dibrugarh, Assam – 786002 |

## ABSTRACT

*Background: The burden of Cardiovascular diseases in India is increasing at an alarming rate for the last few decades, comparatively at higher rate in urban areas. Objectives: To assess the prevalence of behavioural risk factors of CVDs among high school students of government schools in urban Dibrugarh. Methods: A cross sectional study was conducted among 300 adolescents studying in class 8-10 of government schools using 2 stage random sampling. Data was collected using pretested questionnaire and statistical analysis was done using proportions and chi square test. Results: Prevalence of tobacco use was 96(32%) with 68(22.66%) being current users while alcohol use was found in 26(8.66%). Inadequate intake of green leafy vegetables(≤3 servings/week) was found in 156 (52%) and fruits in 210(70%). Added salt was found in 136(45.33%) and physical inactivity in 72(24%). Conclusion: There is need to reduce the risk factor prevalence of CVD to address the future epidemic of non communicable disease.*

**Introduction:**

Cardiovascular diseases (CVDs) are major contributor to the global burden of chronic diseases causing 29.3% of global deaths and 9.9% of total disease burden being reported in 2003.1 The burden of CVD is predicted to increase substantially by year 2020 due to rising rates of hypertension, dyslipidemia, diabetes, obesity, physical inactivity and tobacco use. 2,3 Earlier, increased prevalence of CVDs was experienced in developed countries but now it is increasing in developing countries like India because of epidemiological transition and adoption of western life-style like low physical activity, high energy food and substance abuse like tobacco and alcohol.4 In India CVD is projected to be largest cause of death and disability by 20203. Mortality in adulthood is largely due to behaviour initiated in adolescence. According to WHO, 70 per cent of the deaths in adulthood are due to life-style or behavioural risk factor like tobacco use and indulging in unsafe sex during adolescence.5 Risk factors of CVDs like physical inactivity, tobacco and alcohol use, unhealthy diet and obesity are generally adopted during this period. However, most of the risk factors that affect children can be controlled early in life, lowering the risk of heart disease later in life. Indian adolescents constitute more than 22% of the total country's population and are particularly vulnerable to the risk of CVDs. There is a need to assess CVD risk and its associations with diet, body fat and physical activity to know the current status amongst school going adolescents and hence this study was conducted.

**Subjects and Methods:**

A cross-sectional study was conducted from May to October 2012 in the government schools of urban Dibrugarh, Assam. The study universe was adolescents studying in 8-10th standards in schools of urban Dibrugarh. Considering the prevalence of tobacco use among school students of class 8-10 of Assam to be 40.1%[6] and taking 15% relative error, the required sample size was 267. Considering 10% non response and rounding off, the final sample size calculated was 300. Students from schools having enrolment less than 50 in each class and students who did not give consent to participate in the study were excluded from the study.

**Sampling design:**

Two stage sampling was used in which during first stage, school enrolment was done by simple random sampling, where the list of all government schools having grades 8 to 10; procured from Inspector of Schools, Urban Dibrugarh was used. Out of 22 schools, 15 schools fulfilled inclusion criteria from which three were selected. Student enrolment was done by probability proportional to enrolment size. In the second stage, list of all students studying in each school was obtained and participants were selected using computerised random numbers. Prior written permission was taken from the concerned principals of the respective schools. After explaining the aims and objectives of the study, written consent was taken from the students.

**Data collection tools and measurements:**

Data was collected using WHO STEP wise methodology in which socio-demographic information was collected using a pre - designed and pretested questionnaire along with data on dietary habits, physical activity. Socio -economic class of the students was decided by the modified Kuppuswamy's classification.[7]

For blood pressure (BP) measurement, the student was seated in a quiet and restful room for at least 5 minutes. BP was measured twice from the right arm with an interval >1 minute between two measurements using mercury sphygmomanometer with an appropriate size cuff. Average of these two blood pressure measurements was used in the analyses. Hypertension was defined as Systolic and/or diastolic BP equal to or greater than the 95th percentile according to the reference values of the Update on the 1987 Task Force Report on High Blood Pressure in Children and Adolescents (Task Force, 1996), for corresponding age and sex, adjusted for the height percentile of the assessed individual8 while prehypertension in children is defined as average SBP or DBP levels that are greater than or equal to the 90th percentile, but less than the 95th percentile. To define the height percentile we used the National Center for Health Statistics (NCHS) growth charts.9

For statistical analysis, percentages were calculated and chi-square test done using SPSS version 16 software. Ethical clearance was taken from Institutional Ethical Committee prior to enrolment of cases.

**Results:**

A total of 300 students participated in the study with a mean age of 14.65 ± 1.24 years and a mean family size of 6.14 ± 1.14. Students belonging to socio-economic class III, IV and V (73.33%) according to modified Kuppuswamy's classification were more common than class I and II (26.66%). More than 50% students' parents had education upto middle school certificate while 5.33% were illiterate. The occupational profile of students' parents showed that 82(27.33%) were involved in unskilled labour, 68(22.66%) were shop owners and clerical workers while 8(2.66%) were unemployed.

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Prevalence of tobacco use was 96(32%) with 68 (22.66%) being current users while alcohol use was 26(8.66%). Inadequate intake of green leafy vegetables (≤3 servings/week) was found in 156 (52%) and fruits in 210(70%). Weekly intake of high energy food was found in 176(58.66%) while added salt intake was found in 136(45.33%). Physical inactivity was found in 72(24%) while 200(66.66%) reported mainly sedentary habits during leisure time activity. Prevalence of hypertension was 58(19.33%) with 70(23.33%) being prehypertensives.

Association of hypertension with various risk factors is shown in Table 1. While tobacco consumption, physical activity, stress, less intake of fruits and vegetables and added salt intake were found to be significantly associated with hypertension ($p<0.05$), no significant association was seen with alcohol use and leisure time activity.

**Discussion:**

The present study was a cross sectional one, which tried to elicit the behavioural risk factors contributing to the development of cardiovascular diseases in high school students studying in government schools of urban Dibrugarh.

In our study, ever tobacco use was reported by 32% out of which 22.66% were currently using tobacco products. Various studies in urban areas of India had reported prevalence of tobacco chewing/ smoking ranging 0.2 per cent to 41.1 per cent among adolescents.[10-12] The Global Youth Tobacco Survey (2000-2004) which examined the prevalence of tobacco use in school children of 13-15 years age group in 26 states of India, reported ever use of any tobacco product in Assam being 40.1%. Tobacco consumption was found to be significantly associated with hypertension ($p=0.000$). Alcohol consumption was reported by 8.7% though there was no significant association with hypertension ($p= 0.566$).

Regarding dietary habit, 45.33 per cent of the urban students were taking extra salt and there was significant association between salt intake and hypertension ($p=0.002$). Similar findings have been reported in studies across the globe.13,14

It is generally agreed that stress aggravates blood pressure and predisposes the individual to develop hypertension.[15] Taking this as risk factor, moderate to severe stress was found in 26% students and it was significantly associated with hypertension ($p=0.019$). In the present study, 36 per cent of the urban adolescents were taking high energy food more than three times a week which was similar to the findings by Akhil Kant Singh et al in New Delhi[16] and by S Kumar et al.

In our study, 24% reported physical activity < 1 hr/ day which was slightly higher than the findings by Akhil Kant Singh et al.[16]

**Conclusion:**

From this study, it is seen that prevalence of behavioural risk factors of cardiovascular diseases was quite high among the students. Given that many CVD risk factors track through adolescence and into adulthood, there is need to reduce them to address the future epidemic of non communicable disease amongst this group. Different health promotional activities can be implemented with implementation research for better evidence generation beginning at an early age. Since students spend most of their time in the school environment, schools can formulate policies for addressing foods and snacks consumed in the school premises as well as outside, for behavioural skill training, for promotion of sports and recreational activities and for tobacco free settings.

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**TABLE 1 Prevalence of Behavioural risk factors of cardiovascular diseases and their association with blood pressure**

| Risk factors | | Prevalence rate ( n = 300) | Blood pressure | | | $c^2$ value | p value |
|---|---|---|---|---|---|---|---|
| | | | Normal (n=172) | Pre – hypertension (n=70) | Hypertension (n=58) | | |
| Tobacco use | Never used | 204 (68%) | 129 | 52 | 23 | 27.627 | 0.000 |
| | Formerly used | 28 (9.3%) | 12 | 7 | 9 | | |
| | Currently use | 68 (22.7%) | 31 | 11 | 26 | | |
| Alcohol use | Present | 26 (8.7%) | 16 | 7 | 3 | 1.140 | 0.566 |
| | Absent | 274 (91.3%) | 156 | 63 | 55 | | |
| Physical Activity | < 1 hr / day | 72 (24%) | 12 | 23 | 37 | | |
| | >1 hr / day | 228 (76%) | 160 | 47 | 21 | 80.700 | 0.000 |
| Leisure time activity | Mainly sedentary | 200 (66.7%) | 117 | 44 | 39 | 4.093 | 0.664 |
| | Mild exercise | 24 (8%) | 13 | 8 | 3 | | |
| | Moderate exercise | 44 (14.7%) | 22 | 13 | 9 | | |
| | Severe exercise | 32 (10.6%) | 20 | 5 | 7 | | |
| Added salt | Taken | 136 (45.3%) | 58 | 40 | 38 | 22.800 | 0.000 |
| | Not taken | 164 (54.7%) | 114 | 30 | 20 | | |
| Green Leafy vegetables intake | <3 times / week | 156 (52%) | 104 | 19 | 33 | 22.800 | 0.000 |
| | >3 times / week | 144 (48%) | 68 | 51 | 25 | | |
| Fruits intake | <3 times / week | 210 (70%) | 118 | 59 | 33 | 11.704 | 0.003 |
| | > 3 times / week | 90 (30%) | 54 | 11 | 25 | | |
| High energy food including snacks | < 3 times / week | 192 (64%) | 127 | 43 | 22 | 24.5 | 0.000 |
| | >3 times / week | 108 (36%) | 45 | 27 | 36 | | |
| Stress | Little / none | 222(74%) | 146 | 51 | 25 | 39.400 | 0.000 |
| | Moderate / severe | 78 (26%) | 26 | 19 | 33 | | |

## REFERENCE

| 1. World Health Organization. The World Health Report 2004; Changing history. Geneva : WHO; 2004. | 2. Murray CJL, Lopez AD, Global Health Statistics. Global Burden of disease and Injuries series, Boston (MA); Harvard School of Public Health; 1996. | 3. World Health Organization. The World Health Report 2002; Reducing risks, promoting life. Geneva : WHO; 2004. | 4. Reddy KS 2002; Cardiovascular diseases in developing countries; Dimensions, determinants, dynamics and directions for public health action. | 5. Adolescent and Child Health Programme-Family and Reproductive Health (1998): | WHO, Geneva, 18. | 6. Sinha D.N., Gupta P.C., Pednekar M.S.: Tobacco use among students in the eight North-eastern states of India. Indian Journal of Cancer. 2003; 40(2): 43-59 | 7. Kumar N, Gupta N, Kishore J. Kuppuswamy's socioeconomic scale: Updating income ranges for the year 2012. Indian J Public Health 2012; 56:103-4 | 8. Moura AA et al; Prevalence of high blood pressure in children and adolescents from the city of Maceió, Brazil. J Pediatr (Rio J). 2004;80(1):35-40 | 9. Hamill PVV, Drizd TA, Johnson CL, Reed RB, Roche AF, Moore WM. Physical growth: National Center for Health Statistic Percentiles. Am J Clin Nutr. 1979;32: 607-29. | 10. Arora M. & Reddy K.S. (2005): Global Youth Tobacco Survey- Delhi; Indian Pediatrics on: http:// indianpediatrics.net/nov2012/850.pdf | 11. PD Madan Kumar, S Poorni & S Ramachandran (2006): Tobacco Use among School Children in Chennai City; Indian J Cancer, 43(3): 113-127. | 12. Tripathi B.M. & Lal Rakesh (1999): Substance Abuse in Children and Adolescents; Indian J Pediatrics; 66: 569-575. | 13. Sacks F.M., Svetkay L.P., Vollmer W.M., Appel L.J. & Bray G.A. (2001): Effects of Blood Pressure of Reduced Dietary Sodium and the Dietary Approaches to Stop Hypertension (DASH) Diet: DASH-Sodium Collaborative Research Group; N Engl J Med; 344: 3-10. | 14. FJ He, NM Marrero and GA MacGregor (2007): Salt and blood pressure in children and adolescents; Journal of Human Hypertension (2008) 22, 4–11. | 15. P. Mustacchi et al (1990): Stress and Hypertension in Adolescents; West J Med, 153(2): 180-185. | 16. Akhil Kant Singh et al (2006): Lifestyle Associated Risk Factors in Adolescents; Indian J Pediatrics; 73 (10) : 901-906 | |