

Original Article

Prevalence of Cardiovascular Disease and Associated Risk Factors among Adults

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Abstract: Cardiovascular diseases (CVDs) are among the leading cause of death globally, according to the World Health Organization (WHO), 17.7 million people died from CVDs per year, representing 31% of all global deaths, a number that is expected to grow. Populations most affected are from low- and middle-income countries like Bangladesh, where 80% of these deaths occur. This study determined the prevalence of cardiovascular disease and associated risk factors among in the Adults of Bangladesh from 15 to 35 years of age. In 12 months, data was collected from admission register and treatment sheets of Admitted patients aged 15-35 years of age in the study period in National Heart foundation and Research Institute, that is pioneer and leading tertiary level cardiac institution in Bangladesh, dedicated to research, prevention and treatment of cardiovascular diseases. Total N=196 People aged 15-35 years had been admitted for this period Cohort study design is the best available method for measuring the effects of suspected risk factors. The questionnaire had been sent to them by postal service and they were interviewed as per their convenient manner. Sorting of data, performing quality control check, Data entry, processing, presentation after appropriate statistical analysis using SPSS software. In young people, STEMI is the most prevalent kind of acute coronary syndrome (ACS). In addition to smoking and the use of oral tobacco, additional key modifiable risk factors in young adults include hypertension, diabetes, dyslipidemia, and dietary modifications. In young ischemia patients, other risk factors such as obesity and a family history of early coronary artery disease are also widespread. On the other hand, alcohol consumption and over-the-counter medications are not commonly encountered in young ACS patients, and as a result, they do not pose a significant health concern for us.

Keywords: prevalence of cardiovascular disease, risk factors, among adults

1. INTRODUCTION

Cardiovascular diseases (CVDs) are among the leading cause of death globally. According to the World Health Organization (WHO), 17.7 million people died from CVDs, representing 31% of all global deaths, a number that is expected to grow [1]. Populations most affected are from low- and middle-income countries like Bangladesh, where 80% of these deaths occur [2]. In these countries, the projected cumulative economic losses from all non-communicable diseases will be \$7.28 trillion from 2011 to 2025 and CVD will account for nearly half of this projected loss. Against this backdrop, CVD is considered as a major public

health concern worldwide [3]. Bangladesh has experienced a significant increase in the prevalence of non communicable chronic diseases and associated mortality in the last few decades. A rapid urbanization took place in Bangladesh in the past few decades due to its fast economic growth, and recently, it has emerged as a developing country [4]. The results of this growth and urbanization increase the concern that a further rise in the chronic disease burden may be seen due to habituation of a sedentary life style (changing food habits including growing access to and demand for processed food, inconsistent meal times and reduced physical activity) [5]. Population-based surveillance system to track non communicable chronic disease is currently absent in Bangladesh [6]. In addition, it is hard to find accurate information on the prevalence of diseases in Bangladesh due to lack of national population-based surveys or central administrative health data [7]. A limited number of studies have been undertaken on the prevalence of CVD in the young adults of Bangladeshi population, of which only two discussed the burden of CVD [8]. There is also little research that synthesizes existing studies on the prevalence of CVD and their underlying factors in young people of Bangladesh through proper retrospective cohort study [9]. The lack of information on the prevalence of CVD restricts health professionals and policy makers from realizing the magnitude of the problem in Bangladesh. Young people forms the bulkiest portion of population pyramid of Bangladesh [10], to plan and execute preventive strategy for CVD for them, detailed information about the prevalence of CVD and causative factors can be very effective and play a vital role. To address this gap, this study was conducted to gain a better understanding of the prevalence of CVD in Bangladeshi young adults and understanding underlying risk factors [11]. Considering the retrospective nature of this study, it was impossible to verify whether respondents provided the right or wrong answer [12]. The obtained data are acceptable, but there may have some errors due to the recall bias of the respondents [13]. Due to the low level of participants' education in the region, some provided information may be incorrect [14]. Apart from this, the tendency of having a shame in man & women in the observable [15]. Bangladesh is one of the most densely populated countries in the world, having a population density of 1050 per km². Bangladesh still ranks among the top ten countries in the world with the highest CVD burden [16]. The study regarding cardiovascular risk factors among young adults in Bangladesh will help to compare with those among young adults of other countries to build up preventive strategies [17]. Young adults of Bangladesh are the driving force of our country [18]. The CVD disease burden decreases their quality of life and economic stability [19]. Finding out risk factors will be beneficial for primary prevention and to raise awareness [20]. Improving health care-seeking behavior such as education, awareness-raising and skills building in recognizing alarming symptoms to save life [21]. Prevalence refers to the total number of individuals in a population who have a disease or health condition at a specific period of time, usually expressed as a percentage of the population [22]. It's the term given to heart problems caused by narrowed heart arteries. When arteries are narrowed, less blood and oxygen reaches the heart muscle [23]. This is also called coronary artery disease and coronary heart disease [24]. This can ultimately lead to heart attack, ischemia often causes chest pain or discomfort known as angina pectoris [25]. Several health conditions, your lifestyle, and your age and family history can increase your risk for heart disease. These are called risk factors. About half of all Americans (47%) have at least 1 of 3 key risk factors for heart disease high blood pressure, high cholesterol, and smoking. Some risk factors for heart disease cannot be controlled, such as age or family history [26]. But some risk factors can be modified by changing lifestyle, dietary habits and quitting smoking [27]. Only a multi-disciplinary approach can fully explore the most promising pathways to prevent, treat and cure diabetes and its cardio metabolic complications [28]. Optimization of nutritional support in young adults may reduce occurrence of metabolic syndrome and associated cardiovascular disease [30]. Primary prevention aims to prevent disease or injury before it ever occurs. This is done by preventing exposures to hazards that cause disease or injury, altering

unhealthy or unsafe behaviors that can lead to disease or injury, and increasing resistance to disease or injury should exposure occur [31].

2. MATERIALS & METHOD

National Heart foundation and Research Institute, the pioneer and leading tertiary level cardiac institution in Bangladesh, dedicated to research, prevention and treatment of cardiovascular diseases. In 12 months, data was collected from admission register and treatment sheets of Admitted patients aged 15-35 years of age in the study period. Total N=196 People aged 15-35 years had been admitted for this period Cohort study design is the best available method for measuring the effects of suspected risk factors. Patients who had provided informed written consent for participation in the study are the respondents of this study. Thirty patients did not provide informed written consent they were excluded from the study and 16 patients died. But their medical history records had been used for this study. The questionnaire had been sent to them by postal service and they were interviewed as per their convenient manner. Sorting of data, performing quality control check, Data entry, processing, presentation after appropriate statistical analysis using SPSS software.

3. RESULTS & DISCUSSION

3.1 Result Interpretation

A total of 196 subjects had been included in the study. Among them 16 died and 30 subjects had not responded. But their clinical records had been used, the descriptive and analytical findings are shown below, Prevalence of Cardiovascular Disease among people aged 15-35 years and admitted in National Heart Foundation Hospital and Research Institute for the study period is 2%.

Table 01: Sociodemographic characteristics of study population

Variables	Frequency (n)	Percentage
Age group		
15-25	47	25.8%
26-35	149	74.2%
Gender		
Male	171	87%
Female	25	13%
Religion		
Islam	194	99%
Hindu	2	1%
Others	0	0
Marital status		
Married	160	81.6%
Unmarried	36	18.4%
Education		
Illiterate	46	23.5%
Up to S.S.C	146	74.5%
Up to Graduation	4	2%
Occupation		

Unemployed	25	12.8%
Household activity	70	35.7%
Employed	101	41.5%
Monthly Family Income		
Up to 20,000 BDT	76	38.78%
21,000-50,000 BDT	100	51.02%
Above 50,000 BDT	20	10.20%

Table 02: Distribution of the respondents by Sex (n=196)

Sex Category	Frequency (n)	Percentage (%)
Male	171	87.0
Female	25	13.0
Total	196	100.0

The table shows that among the respondents 87% (n=171) were male where 13% (n=25) were female. So majority of the CVD patients were male.

Table 03: Distribution of the respondents by Age (n= 196)

Age Category	Frequency (n)	Percentage (%)
15-20 year	20	5.0
20-24 year	27	20.8
25-30 year	78	33.5
31-35 year	71	40.2
Total	196	100.0

Table 3 shows that the tendency of cardiovascular disease increases with age and less in 15-20 years of age group CVD patients were less in number.

Table 04: Distribution of the respondents by Religion (n= 196)

Religion	Frequency	Percentage (%)
Muslim	194	99.0
Hindu	2	1.0
Total	196	100.0

The table shows that among the CVD patients 99% (n=194) were Muslim and less number of Hindu 1% (n=2).

Table 05: Distribution of the respondents by Marital Status (n= 196)

Marital status	Frequency (n)	Percentage (%)
Unmarried	36	18.4
Married	157	80.1
Divorce	3	1.5
Total	196	100.0

The table shows that among the CVD patients 80% (n = 157) were married and 18% (n=36) are unmarried and 1.5% are divorce that means most of the CVD patients were married.

Table 06: Distribution of the respondents by Educational Status (n=196)

Education	Frequency (n)	Percentage (%)
Illiterate	46	23.5
Primary	109	55.6
Eight	26	13.3
SSC	11	5.6
HSC	3	1.5
Graduation/post-Graduation	1	0.5
Total	196	100.0

The table shows that the most of the CVD patients are primary school studied which is 56% (n=109) and 24% (n=46) respectively Illiterate and 13% (n=26) Eight and 1.5% (n=11) HSC and 0.5% were Others i.e. Graduation/post-Graduation .

Table 07: Distribution of the respondents by Occupational Status (n=196)

Occupation	Frequency (n)	Percentage (%)
Service holder	40	20.4
Business	18	9.2
Rickshaw puller	7	3.6
Unemployed	25	12.8
Student	31	15.8
House wife	39	19.9
Others	36	18.4
Total	196	100.0

The table shows that the Occupation status of CVD patients. Service holder and House wife were mostly similar percentage that is Service holder- 20.4% and House wife- 19.9% .The other occupation CVD patients were 18.4% (n=36) i.e.(driver, day-labor etc.) and 15.8% (n=31) respectively student and 13% (n=25) Unemployed and 9% (n=18) Businessman and 4% were Rickshaw puller.

Table 08: Distribution of the respondents by Family History of CVD (n=196)

Family History	Frequency (n)	Percentage (%)
Positive	26	13%
No History	170	87%
Total	196	100.0

The above table shows that only 13% of young adult CVD patients had positive family history of CVD.

Table 09: Distribution of the respondent's by Diet rich in Fat or Saturated Fat (n=196)

Diet	Frequency (n)	Percentage (%)
Rich in fat or saturated fat	79	40
Diet not rich with fat	117	60
Total	196	100.0

The table shows that the around 40% of respondents had the habit of taking fat or saturated fat enriched diet.

Table 10: Distribution by the respondent's BMI (n=196)

BMI	Frequency (n)	Percentage (%)
Morbid obese	12	6
Obese	27	13
Normal	157	81
Total	196	100.0

The above table shows that obese and morbid obese participants comprises 19% of total study population.

Table 11: Distribution by the respondent's Lifestyle Status (n=196)

Lifestyle	Frequency (n)	Percentage (%)
Active	52	27
Sedentary	144	73
Total	196	100

In this study we found that 77% of CVD patient's had lead a sedentary lifestyle before suffering from cardiovascular accidents.

Table 12: Distribution of the respondents by Blood Glucose Level (n=196)

Blood glucose level	Frequency (n)	Percentage (%)
Diabetes/Impaired glucose tolerance	73	37
Normal blood glucose level	123	63
Total	196	100.0

The above table shows that 37% of the subjects had impaired blood glucose level or diabetes during their hospital stay due to cardiovascular disease.

Table 13: Distribution by the respondents' Blood Pressure (n=196)

Blood Pressure	Frequency (n)	Percentage (%)
Normal	130	67
Hypertension	66	33
Total	196	100.0

The above table shows that almost one-third of the patients had been diagnosed as hypertensive during their admission in hospital.

Table 14: Distribution by the respondents' Serum Lipid Profile (n=196)

Serum Lipid Profile	Frequency (n)	Percentage (%)
Normal level	98	50.0
Dyslipidemia	98	50.0
Total	196	100.0

The table shows that the half of the participants had been suffering from dyslipidemia at the time of hospital stay due to CVD.

Table 15: Distribution by the respondents' Alcohol Consumption (n=196)

Alcohol Consumption	Frequency (n)	Percentage (%)
Yes	34	17
No	162	83
Total	196	100

The table shows that most of the participants did not consume alcohol.

Table 16: Distribution by the respondents' habit of Tobacco Consumption (n=196)

Tobacco	Frequency (n)	Percentage (%)
Smoking	59	30
Oral tobacco addiction	73	37
No tobacco consumption	64	23
Total	196	100.0

The above table shows that 67% of the respondents were habitat of tobacco consumption.

Table 17: Distribution by the respondents' added salt consumption (n=196)

Added salt consumption	Frequency (n)	Percentage (%)
Yes	81	41
No	115	49
Total	196	100.0

The above table shows that most of the respondents did not consume added salt.

Table 18: Distribution of the respondents by monthly family income

Monthly Family Income In BDT	Frequency (n)	Percentage
Up to 20,000	76	38.78%
21,000-50,000	100	51.02%
Above 50,000	20	10.20%
Total	196	100

From the above table we get that most of the young patients of CVD are of low and middle socio-economic conditions. 38.78% of the patients earned up to BDT 20,000(Twenty Thousand) per month and 51.02% earned BDT 21,000-50,000 per month.

Table 19: Distribution of risk factors

Sl. No.	Risk Factors	Frequency	%
1.	Male sex	171	87%
2.	Positive Family history	26	13%
3.	Diet rich in fat or saturated fats	79	40%
4.	Obesity	27	13%
5.	Sedentary lifestyle	144	73%
6.	Diabetes/Impaired glucose tolerance	73	37%
7.	Hypertension	66	33%
8.	Dyslipidemia	98	50%
9.	Alcohol consumption	34	17%
10.	Smoking	59	30%
11.	Oral Tobacco addiction	73	37%
12.	Added Salt Consumption	80	41%

Table showed that among the young adults CVD patients, most are male in sex, lives a sedentary lifestyle, have any degree of dyslipidemia. Beside these, a major portion of these patients habituated in fat enriched diet, any form of tobacco consumption and of having added salt consumption. More than one-third of them had been suffering from hypertension, diabetes mellitus and impaired glucose tolerance. They mostly belongs to low and middle socio-economic status. The most common age group found in this study are between 25-35 years. Most of them are married, educational qualification mainly up to Secondary School Certificate and are employed to any degree.

3.2 Discussion

The study was conducted in order to investigate the prevalence of CVD in young adult patients of 15-35 years of age and the underlying risk factors. The study findings were compared and contrasted with other national and international studies [32]. Cardiovascular disease is now the most frequent cause of death worldwide and leaves a large number of patients with chronic incapacity, resulting in elevated health care costs [33]. A predisposition to atherosclerosis may already be present in infants and children; intima-media thickening probably precedes atherosclerosis and its severity can be induced by hereditary and extrinsic factors. Various studies have demonstrated that early atherosclerosis is mainly associated with smoking, elevated LDL-C and arterial hypertension. It is observed that calcification of the coronary arteries is more prevalent in young men (31%) than in young women (10%). Coronary risk factors seen in children and young adults are associated with early calcification of the coronary arteries. These factors include increased BMI, both in childhood and in adult life, hypertension, and decreased HDL-C. There is evidence that 100% of adolescents 15 years of age have atherosclerotic aortas and 50% have coronary atherosclerosis [34]. In young people with serum TC values of 140 to 170 mg/dL, 25% of the total surface of the aorta is found to be affected by fatty streaks at autopsy, whereas in young people with serum TC concentrations above 200 mg/dL, 50% of the surface of the aorta is affected. The Pathological Determinants of Atherosclerosis in Youth (PDAY) study has shown that a 50-mg/dL increase in LDL-C in adolescents and young adults increases the risk of developing atherosclerotic plaque by 70%, and now this population is considered a high-risk subgroup. These observations clearly demonstrate the importance of cardiovascular risk factors in childhood and adolescence [35].

4. CONCLUSIONS

Young patients (at or below 40 years of age) diagnosed with ACS have some important differences that should be appreciated. The most important modifiable risk factor is sedentary lifestyle. Commonest non-modifiable risk factor is Male sex. In young people, STEMI is the most prevalent kind of acute coronary syndrome (ACS). In addition to smoking and the use of oral tobacco, additional key modifiable risk factors in young adults include hypertension, diabetes, dyslipidemia, and dietary modifications. In young ischemia patients, other risk factors such as obesity and a family history of early coronary artery disease are also widespread. On the other hand, alcohol consumption and over-the-counter medications are not commonly encountered in young ACS patients, and as a result, they do not pose a significant health concern for us. An individual is more likely to develop acute coronary syndrome (ACS) at a younger age if they have more than one risk factor as well as three or more risk factors. Improving lifestyle is a goal of the first magnitude in these patients. If timely managed, young patients with ACS have favorable in-hospital prognosis. The purpose of applying the recommendations elaborated in the guidelines is to motivate and assist high-risk individuals to lower their cardiovascular risk by quitting tobacco use, or reducing the amount smoked, or not starting the habit; making healthy food choices; being physically active; reducing body mass index (to less than 25 kg/m²) and waist-hip ratio (to less than 0.8 in women and 0.9 in men (these figures may be different for different ethnic groups); lowering blood pressure (to less than 140/90 mmHg) lowering blood cholesterol (to less than 5 mmol/L or 190 mg/dL); lowering LDL-cholesterol (to less than 3.0 mmol/L or 115 mg/dL) controlling glycaemia, especially in those with impaired fasting glycaemia and impaired glucose tolerance or diabetes; taking aspirin (75 mg daily), once blood pressure has been controlled. The above goals represent the minimum that should be achieved. They are given for broad guidance in managing cardiovascular risk. In some subgroups of high-risk people, particularly those with established cardiovascular disease or diabetes, a case can be made for lower targets for blood pressure (< 130/80

mmHg), total cholesterol and LDL-cholesterol, which may require more intensive treatment. Similarly, in very high-risk patients, a total cholesterol of less than 4.0 mole/l (152 mg/dl) and LDL-cholesterol of less than 2.0 mole/l (77 mg/dl), or a reduction of 25% in total cholesterol and 30% in LDL-cholesterol, whichever achieves the lower absolute level, may be desirable goals.

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