Original Article

Prevalence of Risk Factors among Myocardial Infarction Patients Admitted in a Tertiary Level Hospital

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Abstract

Background: *Cardiovascular diseases (CVDs), one of the non-communicable diseases, has become a major public health problem in many developing countries and myocardial infarction (MI) is the number one cause of death globally.* ***Objective:*** *To assess the prevalence of risk factors of MI among the admitted MI patients of Combined Military Hospital (CMH), Dhaka, Bangladesh.* ***Materials and method:*** *This cross-sectional observational study was conducted from July to December 2012 among 104 MI patients admitted in CMH, Dhaka, Bangladesh. Data were collected through face-to-face interview using a pretested semi-structured questionnaire.* ***Results:*** *Majority of the respondents (61.5%) were smoker and almost all of them used to do physical exercise in terms of mild, moderate and severe forms; 26.0%, 54.8% and 19.2% respectively. About 62.5% had a history of taking extra salt with food and 16.34% were obese in terms of body mass index (BMI). Almost all of them had several chronic diseases like hypertension, diabetes mellitus (DM), chronic obstructive airway disease (COPD) and bronchial asthma. Association between smoking habit with age group, BMI and monthly income revealed statistically significant relation ($p<0.05$).* ***Conclusion:*** *In this study preventable risk factors were associated with MI. Appropriate preventive measures should be taken by the competent authority to control the preventable risk factors of MI.*

Keywords: *Myocardial infarction; Risk factors; Smoking; Physical exercise.*

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Introduction

Cardiovascular diseases (CVDs), one of the non-communicable diseases (NCDs), has become a major public health problem in many developing countries and myocardial infarction (MI) is the number one cause of death globally.[1] An estimated 17.3 million people died from CVDs in 2008, representing 30% of all global deaths.[2] Over three quarters of deaths due to CVD take place in low- and middle-income countries. Out of the 17 million premature deaths (under the age of

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70) due to non-communicable diseases in 2015, 82% are in low- and middle-income countries, and 37% are caused by CVDs.[1] By 2030, almost 23.6 million people will die from CVDs, mainly from heart disease and stroke. These are projected to remain the leading causes of death. CVDs are on a continuum from hypertension to atherosclerosis, and afflict many people in various ways.[3] CVDs can take many forms from being diagnosed with hypertension and beginning a medication regimen to having coronary plaques in the coronary arteries leading to a narrowing of the vessels which in turn causes a decrease in blood flow to the heart muscle. This process of vessel narrowing can take years to develop and is accelerated by co-morbid factors such as hypertension, diabetes mellitus, high cholesterol and hyperlipidemia. Once the vessels are narrowed by the fatty plaques there is a decrease in blood flow through the coronary arteries, thus a lack of oxygen to the myocardium. The lack of blood flow and oxygen can cause myocardial ischemia resulting in the symptoms of coronary artery disease such as angina, shortness of breath, and pain. If the ischemia is significant and prolonged, the myocardial tissue will become necrotic resulting in a myocardial infarction.[2] Bangladesh is a developing country burdened with communicable diseases. However, like many other low-income countries in the world, she has been experiencing epidemiological transition; the prevailing disease pattern is changing from communicable diseases to NCDs. The major causes of death in Bangladesh gradually shifted from acute infectious and parasitic diseases to NCDs. In 1986, NCDs represented only 8% of total deaths compared to 52% of deaths due to communicable diseases, whereas in 2014, NCDs are estimated to account for 59% of total deaths; CVD is the single-most important contributor, and is responsible for 17% of total mortality.[3] The burden of the disease is rising day by day in the country as well as in the Armed Forces. The main affected group is 40 to 60 years that refers to productive period of life. It is notable that most of the cases of MI occur in all ranks of armed forces personnel of Bangladesh Army at around the end of service Myocardial infarction (MI) is linked with high morbidity, disability and mortality in most of the countries. This study was carried out to find out the prevalence of risk factors of myocardial infarction (MI) patients admitted in combined military hospital, Dhaka, Bangladesh.

Materials and method

This cross sectional study was conducted from July to December 2012 among 104 MI patients in Combined Military Hospital, Dhaka, Bangladesh, to assess the prevalence of myocardial infarction. Data were collected through face-to-face interview using a pretested semi-structured questionnaire. Prior to conducting the study ethical clearance was taken from Ethical Committee of Armed Forces Medical Institute (AFMI), Dhaka, Bangladesh. The questionnaire comprised of various risk factors related to MI along with sociodemographic information of the respondents. The smoking habit was stratified according to the number of cigarettes smoked per day and the duration of smoking. Dietary data was collected through interviews regarding type of food (fruits, vegetables and others). For physical activity, WHO criteria were used. Body mass index (BMI) was computed as weight in kg/meter2. Obesity was defined as a BMI of >27 and overweight was defined as a BMI of >25. Hypertension was diagnosed when the systolic blood pressure was 140 mmHg or more and the diastolic blood pressure was 90 mmHg or more, as per the guidelines of the British Hypertension Society. Twelve lead electrocardiograms (ECGs) were taken using a BPL 108 ECG machine on each individual. Each ECG was reviewed by a cardiologist. Extra salt intake with food, family history of ischemic heart disease (IHD), socioeconomic condition in terms of monthly family income, various comorbidities like diabetes, hypertension, hypercholesterolemia, etc. were also elicited. Data processing and analyses were done using Statistical Package for Social Sciences (SPSS) version 20. Frequencies, percentage, mean and standard deviation (SD) were used for descriptive statistics. To determine

the association between various determinants and MI, chi-square ($\chi 2$) test was done.

Results

More than half (66.3%) of the respondents were in the age group of 45-60 years and around 21.1% were in the age group of <45 years. Average age of the respondents was 51.98 years with SD of 7.78 years and their age range was 31 to 70 years (Table I). About half of them (47.11%) were educated up to class X level. Majority of them (93.3%) were Muslims and 85.6% were married. About 49.03% were retired military personnel. About 40.38% of the respondents gave history of monthly family income of <15,000 Taka with average income of 12,561(±10,462) Taka. Minimum monthly family income was 4,000 Taka and maximum was 60,000 Taka (Table I).

Majority of the respondents (61.5%) were smoker and almost all of them used to do physical exercise interms of mild, moderate and severe forms (26.0%, 54.8% and 19.2%) respectively. About 62.5% had a history of taking extra salt with food 16.34% were obese in terms of BMI. Almost all of them had several chronic diseases like hypertension, diabetes mellitus (DM), chronic obstructive airway disease (COPD) and bronchial asthma (Table II). The association between smoking habit and body mass index of the respondents with selected sociodemographic variables like age group, education and monthly income revealed statistically significant association with age ($p<0.05$) and monthly income respectively but other two variables were not statistically significant ($p>0.05$) (Table III).

Table I: Sociodemographic characteristics of respondents (n=104)

Socio-demographic characteristics	Number	Percentage
Age group of respondents (years)		
< 45	22	21.1
45 – 60	69	66.3
> 61	13	12.5
Mean ± SD	51.98±7.78	
Min-Max	31-70	
Religion		
Islam	97	93.3
Hindu	7	6.7
Marital Status		
Married	89	85.6
Wifeless	15	14.4
Educational level of respondents		
Up to class X	49	47.11
SSC	38	36.53
HSC	17	16.34
Occupational Status of the Respondent		
Serving military personnel	37	35.57
Civilian paid from defense estimate	16	15.38
Retired	51	49.03
Monthly income (Taka)		
≤ 15000	42	40.38
15001-30000	40	38.46
≥ 30001	22	21.15
Mean± SD	12561±10462	
Min-Max	4000-60000	
Service length of the Respondents		
< 20	32	30.8
> 20	72	69.2

Table II: Distributions of the respondents by behavioral risk factors (n=104)

Behavioral risk factors	Number	Percentage
Smoking Habit		
Smoker	64	61.5
Non-Smoker	40	38.5
Physical activity		
Mild	27	26.0
Moderate	57	54.8
Heavy	20	19.2
Extra salt intake		
Yes	65	62.5
No	39	37.5
BMI Status of the Respondents		
<18.5	12	11.53
18.5-24.99	75	72.11
>25- 29.99	17	16.34
Chronic diseases		
Diabetes mellitus (DM)	59	(78.66%)
Hypertension	43	(57.33%)
Chronic obstructive pulmonary disease (COPD)	4	(5.33%)
Bronchial asthma	15	(20%)

Table III: Association between smoking habit with selected sociodemographic variables of the respondents (n=104)

Sociodemographic Attributes	Smoker	Non-Smoker	Statistics
Age group			
< 45	8	14	χ^2=13.28
45 – 60	51	18	df = 2
> 61	5	8	p < 0.01
Education			
Up to Class X	31	18	χ^2=0.634
SSC	24	14	df = 2
HSC	9	8	p > 0.05
Monthly income (Taka)			
≤ 15000	22	22	χ^2=4.884
15001-30000			df = 2
≥ 30001			p > 0.05

Discussion

This research was conducted to assess the prevalence of myocardial infarction among the armed forces personnel reported to Combined

Military Hospital, Dhaka, Bangladesh. Age, income, religion, family size, etc. showed similarity sometimes with national findings of Bangladesh Health and Demographic Survey (BDHS) of 2012 and in few cases differed due to specific group of Bangladesh army or due to the study process. Smoking remains the number one risk factors of CHD worldwide.[4] Among the respondents about 61.50% were smoker where 96.88% were regular smoker and 3.12% were occasional. It was found that the younger age group those were in the active service smoke less but with progress of age they become professional smoker, the study findings were not consistent with the study findings observed by Patwary et al.[5], where he found 73.33% smokers, Ahmed et al.[6] who found 79% smoking rate, Shahidullah et al.[7] found 69.7%, Kabir KR[8] found smoking rate 53%, and Khandoker et al.[9], found rate of smoking 74% as most important risk factor of coronary heart disease.

It was revealed from the study that about 8.65% respondents were suffering from hypertension. (blood pressure > 140/90 mm of Hg). This study finding was not similar to the study findings of Zaman et al.[10], where it was shown that 13% respondents were hypertensive, Malik et al.[11] found 58.9% respondents were hypertensive in his study and Ullah et al.[12] found 20% were hypertensive among adult Bangladeshi.

The mean body mass index of this study population was 22.54 with standard deviation ±1.67 and overweight were 6.73%. This finding of mean BMI is similar to the study conducted by Rahman MM, who had found mean body mass index to be 22.97 but over¬weight were 22.90%.[13] The association between smoking habit and body mass index with age, education and monthly income revealed that age is statistically significant with smoking habit ($p<0.05$) and monthly income is statistically significant with body mass index ($p<0.05$).

Conclusion

Smokers were more among less educated, lower income, aged and civilian serving in Armed Forces. The association between smoking and age was found statistically significant. Monthly income and BMI were found as statistically significant association. Current data strongly support that appropriate preventive measures should be taken by the competent authority against associated factors of myocardial infarction prevailing among the study population.

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