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Original Article

Selected Risk Factors for Myocardial Infarction among the Patients Admitted in Rajshahi Medical College Hospital

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Abstract

Myocardial infarction (MI) is the common form of coronary heart disease. A large number of modifiable risk factors had been identified. This descriptive study was done to observe selected risk factors among the MI patients admitted in CCU of cardiology department of Rajshahi Medical College Hospital in the month of March to June 2005. Data were collected from 200 patients using a closed end questionnaire. Anterior, inferior and non-Q types of MI occupied the major (25%, 24.5% & 20.5%) portion of study subjects, CK-MB level was high in all MI patients, majority (57.5%) of the patients were smoker & most of them had smoked more than 10 cigarettes per day except Non-Q and antero-septal MI patients. Majority (57%) of the patients had systolic blood pressure (SBP) above 140mmHg but had normal diastolic blood pressure (DBP <90mmHg). Serum cholesterol level was high in all patients but majority (55.5%) had LDL within normal range. Less than half (46%) of the patients were diabetic (RBS >8mmol/l).

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Introduction

Myocardial infarction is the most common form of coronary heart disease in the world and cause of premature death. The incidence of myocardial infarction is also increasing in Bangladesh.[1] Rates of cardiovascular disease have risen greatly in low-income and middle-income countries, [2, 3] with about 80% of the burden now occurring in these countries. Effective prevention needs a global strategy based on knowledge of the importance of risk factors for cardiovascular disease in different geographic regions and among various ethnic groups. Risk factors for coronary heart disease vary between populations, e.g., lipids are not associated with this disorder in South Asians[4] and increases in blood pressure might be more important in Chinese people.[5] Known risk factors (generally smoking, hypertension, raised lipids, and diabetes) have sometimes been claimed to account for only about half the risk of a myocardial infarction.[6] Cigarette smoking greatly increase the risk of fatal and non-fatal heart attacks i.e. MI in both men & women.[7] Tobacco smoking is an important modifiable risk factor for IHD in all countries.[8] The prevalence of diabetes, hypertension, smoking and pre-existing heart disease was higher among poorer, less educated patients, as were the total number of cardiovascular risk factors.[9] Abnormal glucose tolerance, dyslipidemia, previously treated hypertension and obesity was more frequently reported in patients with acute myocardial infarction.[10] Prevalence of conventional risk

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factors such as smoking, hypertension and hypercholesterolaemia is no higher in south Asians than in other ethnic groups. [11-14]

High triglyceride concentrations, low concentrations of high-density-lipoprotein (HDL) cholesterol, increased visceral fat, and insulin resistance are more prevalent among south Asians, and these factors have been proposed as reasons for the higher risk of IHD.[15] Elevated serum triglycerides, total cholesterol and LDL-cholesterol are well-established risk factors of cardiovascular disease.[16-19]

There are a few studies about risk factors causing AMI in our country. The present study would highlight the extent of impact of risk factors on MI especially in the northern area of Bangladesh. Finally it would provide information for the cardiologist in their field of work so that cardiologist can advise the IHD patients about the modifiable risk factors to change people's behavior and lifestyle. Hence peoples can prevent further emergency from MI.

Materials and Methods

The study was carried out in the cardiology department of Rajshahi Medical College Hospital among 200 cases of Acute Myocardial Infarction patients during the period from 3rd March 2005 to 3rd June 2005. Data were collected from 200 patients using pre-tested close-ended questionnaire by face interview. The questionnaire was designed to collect information regarding socio-demographic and other biomedical factors that could contribute Acute Myocardial Infarction (AMI). Biomedical information was gathered from investigation reports of the patients. Data were analyzed by computer software program using SPSS windows.

Results

The incidence of AMI was more in the age group 50-59 years constituting 34% with 88.5%male distribution. The study showed that businessman had suffered more from AMI. The incidence of AMI was more among the people of in-come group 5001-10000 taka AMI incidence was 89.5% in educated people (Table I).

Table 1: Socio-demographic characteristics of the MI Patients.

Character	Number	Percent
Age		
<40	31	15.5
40-49	44	22.0
50-59	68	34.0
60-69	39	19.5
>70	18	9.0
Occupation		
Official Job	44	22.0
Teaching	29	14.5
Business	79	39.5
Day laborer	28	14.0
House wife	20	10.0
Monthly income		
<2000	4	2.0
2001-5000	45	22.5
5001-10000	108	54.0
10001-15000	43	21.5
Education		
Illiterate	21	10.5
Primary	46	23.0
SSC	37	18.5
HSC	29	14.5
Grad. & above	67	33.5

Anterior and Inferior MI patients were almost equal in number and each occupied about the quarter portion of the whole patients. Non-Q MI that was 41 (20.5%) of the total patients.(Table II) CK-MB level was high in all types of MI cases. (Table III)Among 200 MI patients 115 (57.5%) was smoker. Among the smokers 80.9% smoked more than 5 years. A remarkable section of the patients (42.5%) were non-smoker. (Table IV) Among the smokers, 53 % had smoked less than 10 sticks of cigarette daily. All patients with Anterior and Inferior MI had smoked more than 10 years that occupied majority types of MI (only exception was Non-Q MI.). (Table V). 80 (40.0%) patients had SBP in between 140 mm Hg to 159 mm Hg. and 34 (17.0%) had SBP above 160 mmHg. Only 86 (43.0%) patient had SBP less than 140 mm Hg. while 57% patient had systolic blood pressure more than 140 mm Hg. (Table VI) Majority of the patients 110 (55 %) the patients had diastolic blood pressure less than 90 mm of Hg. (Table VII) Total serum cholesterol was

estimated in 135 patients. It was above 200 mg/dl in all of them. (Table VIII) Majority of the patients 75 (55.5%) had LDL level within normal limit92(46.0%) of the MI patient had blood sugar above 8.0 mmol/L who were diabetic and 108 (54%) of MI patients were non-Diabetic.

Table II: Category of the MI patients by ECG reports

Category	No.	Percentage
Anterior MI	50	25.0
Inferior MI	49	24.5
Antero-septal MI	36	18.0
Extensive anterior MI	17	8.5
Non-Q MI	41	20.5
Others (Lateral, Antero-lateral, Posterior)	7	3.5
Total	200	100.0

Table III: CK-MB level in different types of MI patients

ECG finding	CK-MB level in the patient (u/L)								Total	
	60-99		100-139		140-179		>180			
Anterior MI	22	44.0%	27	54.0%	1	2.0%			50	100%
Inferior MI	15	30.6%	34	9.4%					49	100%
Antero-Septal.MI	12	33.3%	23	63.9%	1	2.8%			36	100%
Extensive Ant.MI	3	17.6%	14	82.4%					17	100%
Non-Q MI	39	95.2%	1	2.4%			1	2.4%	41	100%
Others	2	28.6%	5	71.4%					7	100%
Total	93	46.5%	104	52.0%	2	1.0%	1	0.5%	200	100%

Table IV: Smoking habit of MI patients

Patients with MI Type	Number of cigarette smoked daily				Total	
	<10		>10			
Anterior MI	13	48.2%	14	51.8%	27	100%
Inferior MI	15	48.4%	16	51.6%	31	100%
Antero-Septal.MI	12	57.0%	9	43.0%	21	100%
Extensive Anterior MI	5	45.5%	6	54.5%	11	100%
Non-Q MI	14	66.6%	7	33.4%	21	100%
Others	2	50.0%	2	50.0%	4	100%
Total	61	53.0%	54	47.0%	115	100%

Table V: Duration of smoking in MI patients

Patient with MI	Duration of smoking of the patient				Total	
	< 5 Year		>5 years			
Anterior MI	4	14.3%	24	85.7%	28	100%
Inferior MI	6	20.0%	24	80.0%	30	100%
Antero-Septal.MI	5	25.0%	15	75.0%	20	100%
Extensive Anterior MI	1	88.3%	11	91.7%	12	100%
Non-Q MI	6	28.6%	15	71.4%	21	100%
Others			4	100.0%	4	100%
Total	22	19.1%	93	80.9%	115	100%

Table VI: Systolic Blood Pressure in different types of MI patients

Patients with MI Type	Systolic Blood Pressure of the patient						Total	
	<140		140-159		>160			
Anterior MI	25	50.0%	15	30.0%	10	20.0%	50	100%
Inferior MI	20	40.8%	20	40.8%	9	18.4%	49	100%
Antero-Septal.MI	14	38.9%	14	3 8.9%	8	22.2%	36	100%
Extensive Anterior MI	5	29.5%	9	52.9%	3	17.6%	17	100%
Non-Q MI	21	51.2%	16	39.0%	4	9.8%	41	100%
Others	1	14.3%	6	85.7%			7	100%
Total	86	43.0%	80	40.0%	34	17.0%	200	100%

Table VII: Diastolic Blood Pressure in categorized MI patients

Patients with MI Type	Diastolic Blood Pressure of the patient								Total	
	< 90		90-99		100-109		>110			
Anterior MI	28	56.0%	3	6.0%	13	26.0%	6	2.0%	50	100%
Inferior MI	28	57.2%	4	8.1%	11	22.5%	6	12.2%	49	100%
Anterior-Septal.MI	18	50%	1	2.8%	8	22.2%	9	25.0%	36	100%
Extensive Anterior MI	8	47.0%	2	11.8%	5	29.4%	2	11.8%	17	100%
Non-Q MI	27	65.9%	7	17.0%	5	12.2%	2	4.9%	41	100%
Others	1	14.3%	2	28.6%	3	42.8%	1	14.3%	7	100%
Total	110	55.0%	19	9.5%	45	22.5%	26	13.0%	200	100%

Table VIII : Total Serum Cholesterol Level in examined MI patients

Patients with MI Type	Total Cholesterol level (mg / dl)								Total	
	200-249		250-299		300-349		350-399			
Anterior MI	15	6.9%	7	1.9%	5	15.6%	5	15.6%	32	100%
Inferior MI	19	58.0%	4	12.0%	8	24.0%	2	6.0%	33	100%
Antero-Septal.MI	21	72.5%	3	10.3%	3	10.3%	2	6.9%	29	100%
Extensive Anterior MI	8	61.5%	3	23.0%	2	15.5%			13	100%
Non-Q MI	14	66.6%	3	14.4%	2	9.5%	2	9.5%	21	100%
Others	4	57.1%			1	14.3%	2	28.6%	7	100%
Total	81	60.0%	20	14.8%	21	5.5%	13	9.7%	135	100%

Discussion

The study showed that the incidence of AMI was more frequent among the patients of age group 50-59 years. It might be due to vulnerablity to atherosclerotic changes of the aging process. The finding coincided with the different authors.[20, 21] The study expressed that 88.5% male suffered from AMI. Man had greater risk of MI than woman. This might be due to natural sex hormone balance of the reproductive period of those. The risk of cardiovascular disease i.e. MI are greater in man than woman. Gender variation of MI of this study coincided with the study of Murray CJL and Lopez AD in Boston, the similar finding was also observed by Yusuf S and et al in 2001.[2, 3] Most of the MI patients were Muslim which might be due to population distribution in Bangladesh. The study pointed out that 79(39.5%) businessman, 44(22%) officials, 29(14.5%) teachers, 28 (14%) day laborer and 20 (10%) housewife had MI respectively. The revealed that businessman were

more affected by MI, might be due to change to affluent life style. This finding was co-related with the study of several researchers[23-25] focused the relation between IHD and economic development. The study showed that major portion of MI patients was found educated would be due to awareness of such people. In this study 115 (57.5%) MI patients were smoker. Among the smokers 90% smoked more than 5 years. MI was particularly more frequent among the smokers both in terms of duration and number of sticks per day smoked by the patients. It would be due to enhancement of atherosclerotic process of the patients. This finding coincided with many different studies in the world and the incidence of MI among the smokers in this study was similar to the findings of McKeigue PM, Ferrie JE, Pierpoint T, Marmot MG, and Prem Pais, Michael P Fay, Salim Yusuf.[15, 22]

From this study we got that MI patients were more affected by high systolic blood pressure than diastolic blood pressure. It might be due to injury of endothelium by systolic blood pressure and thereby enhanced atherosclerosis. Elevated serum triglycerides, total cholesterol, and LDL had been well-established risk factors of cardiovascular disease.but studies on Indian populations had reported that Indians generally did not have higher total cholesterol or LDL concentrations than white or Afro-Caribbean populations, the Indian had lower HDL and higher triglyceride level. The study showed that majority of the patients 75, (55.55%) had LDL- level within normal limit and the total serum cholesterol was high in majority of the MI patients. This finding was similar to studies on Indian populations.[26-31]

The study revealed that 92 (46.0%) of the MI patients had high blood sugar level. Different authors who concluded that increased fasting blood glucose - even in those who were not diabetic became independent risk factors for AMI.[2,3,6,31]

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