



Original Article

Frequency of Metabolic Syndrome in Male Patients with Acute Myocardial Infarction

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Abstract

Background: Acute myocardial infarction is the most common form of coronary heart disease and the single most important cause of premature death worldwide. A large proportion of patients with coronary disease have metabolic syndrome, although the frequency and association of its different components are not well understood. The risk of the metabolic syndrome on AMI has not been well evaluated.

Objective: The aim of this study was to assess the prevalence of the metabolic syndrome and its association with AMI patients. This study will help in awareness building in reducing AMI by early detection of metabolic syndrome.

Patients and methods: This was a prospective observational study consisted of 222 persons of male AMI patients who were aged >20 years. Patients with first time AMI arriving in CCU of Rajshahi medical college during the period of 2012-2014, were included. Data were collected through interview, clinical examination, and laboratory tests. Five components of metabolic syndrome were defined according to criteria set by modified NCEP ATP III (according to ethnic variation) which had abdominal obesity (waist circumference), FBS, HDL-C, Triglyceride, and hypertension were measured within 24 hrs of AMI.

Results: A total of 222 patients diagnosed with AMI were inducted in the study. The mean±SD age of the male was 53.51±11.63 years. Among the male patients highest percentage was in the age group 51-60 years (31.1%) followed by 41-50 years (27%) and then age group >60 (24.3%). Study showed that acute Myocardial infarction patients was more in age group >40 years of age. Highest percentage was observed in abdominal obesity (52.3%) followed by high blood pressure (50.0%) and FPG (46.4%). The Metabolic syndrome was 37.4 % (n=83).

Conclusion: The metabolic syndrome was associated with an increased risk of AMI. The metabolic syndrome had a high prevalence in patients with AMI.

Key words: Metabolic syndrome, acute myocardial infarction, NCEP-ATP III

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Introduction:

The metabolic syndrome (MetS) is a major and escalating public-health and clinical challenge worldwide. Metabolic syndrome confers a 5-fold increase in the risk of type 2 diabetes mellitus (T2DM) and 2-fold the risk of developing cardiovascular disease (CVD) over the next 5 to 10 years¹. Further, patients with the metabolic syndrome are at 2- to 4-fold increased risk of stroke, a 3- to 4-fold increased risk of myocardial infarction (MI), and 2-fold the risk of dying from such an event compared with those without the syndrome² regardless of a previous history of cardiovascular events³. Metabolic syndrome is considered as a first order risk factor for atherothrombotic complications. Its presence or absence should therefore be considered an indicator of long-term risk⁴.

Several expert groups formulated different diagnostic criteria for the metabolic syndrome in different time. In 2001, the Adult Treatment Panel III of the US National Cholesterol Education Program (NCEP)⁵ proposed a simpler definition, developed for clinical uses. The ATP III criterion is more practical and may be a better predictor of coronary heart disease (CHD) risk. ATP III provided a working definition of the metabolic syndrome, which may be easily applied to assess its prevalence in epidemiological studies. As per ATP III, the people meeting three or more of the following criteria qualify as having the metabolic syndrome: raised blood pressure (>130/>85mmHg), a low serum concentration of HDL cholesterol for men < 40 mg/dl (<1.03 mmol/L) and for women < 50 mg/dl (<1.29 mmol/L), a high serum triglyceride concentration > 150mg/dl (>1.70mmol/L), a high fasting plasma glucose concentration (≥ 6.1 mmol/L), and abdominal obesity (waist circumference >102cm in men and >88cm in women).

People with metabolic syndrome and a Framingham risk score greater than 20% have an increased risk of major coronary events over the next 10 years compared with people without

metabolic syndrome (11.8% and 6.4% respectively, $p=0.0001$) and with same risk score⁶. Furthermore, the Framingham risk score based on age, serum concentrations of LDL and HDL cholesterol, blood pressure, cigarette smoking and diabetes mellitus - predicts full development only of cardiovascular disease whereas the presence of metabolic syndrome predicts both diabetes and cardiovascular disease. It has been suggested that co-existence of this clusters of conditions, all of which predispose to cardiovascular disease⁷. Finding features of the metabolic syndrome at an early stage gives the opportunity to act in a timely manner to prevent or postpone cardiovascular insult as well as diabetes by change in lifestyle⁸.

Methodology:

This was prospective observational study carried out in the coronary care unit department in Rajshahi medical college hospital, Rajshahi, Bangladesh. The duration of the study was three years. A systemic sampling technique was done. Every patient who admitted in coronary care unit within the time frame of study was interviewed. Patients who were detected as acute myocardial infarction and who fulfill the inclusion criteria was enrolled in this study.

A systemic sampling technique was done to find out the metabolic syndrome among the attended newly diagnosed acute myocardial infarction patients. All the newly diagnosed acute myocardial infarction patients attending in the coronary care unit department of Rajshahi medical college in the timeframe of study period was interviewed. Purposive sampling technique was followed.

An interviewer administered questionnaire will be used to collect data. Data will be collected by face to face interview. The questionnaire form will be included history, clinical examinations and investigations.

Results:

A total of 222 male patients were inducted in this study. Age distribution of male acute myocardial infarction patients was shown in Table 1 that the mean±SD age of the male was 53.51±11.63 years. Among the male patients highest percentage was in the age group 51-60 years (31.1%) followed by 41-50 years (27%) and then age group >60 (24.3%). Table showed that acute Myocardial infarction patients was more in age group >40 years of age.

Table 1. Age and sex distribution of Acute myocardial infarction patients (N=222)

Age	Male (n=222) N (%)
Upto 30 years	6 (2.7)
31-40 years	33 (14.9)
41-50 years	60 (27.0)
51-60 years	69 (31.1)
>60 years	54 (24.3)
Total	222 (100.0)
Mean ± SD	53.51±11.63

The Socio-demographic statues of the respondents have been presented in Table 2. Highest percentage of education was up to primary level (53.6%). More than half (53.8%) of AMI patients were up to primary level. Most of studied subjects (92.0%) monthly income were ≤15000. More than half (59.5%) of the studied population were from rural area, mostly they were Muslim (94.6%) and smokers (50.5%).

Table 2 Socio-demographic characteristics of the studied patients (N =222)

Variables	Acute myocardial infarction (N=222) N (%)
Educational status	222
up to primary	119(53.6)
Secondary	80(36.0)
Above higher secondary	23(10.4)
Monthly family income(Tk.)	222
≤15000	204(92.0)
>15000	18(8.0)
Residence	222
Urban	90(40.5)
Rural	132(59.5)
Smoking habit	222
Non smoker	110(49.5)
smoker	112(50.5)
Religion	222
Muslim	210(94.6)
Non-Muslim	12(5.4)

Gender wise distribution of components of metabolic syndromes in male AMI patients has been shown in Table 3. Highest percentage was observed in abdominal obesity (52.3%) followed by high blood pressure (50.0%) and FPG (46.4%).

Table 3 Gender wise distribution of components of metabolic syndromes in male AMI patients (n=222)

Individual components	Male (n222) N (%)
Abdominal obesity	116 (52.3)
High Blood pressure	111 (50.0)
Triglycerides	94 (42.3)
Low HDL-C	74 (33.3)
Fasting plasma glucose	103 (46.4)

Prevalence of the metabolic syndrome in male patients suffering from acute myocardial infarction patients (n=222) showed in Table 4. The Metabolic syndrome was 37.4 % (n=83).

Table 4. Gender difference in the prevalence of the metabolic syndrome in acute myocardial infarction (n= 222).

Gender	Status of metabolic syndrome		Total N (%)	p
	Having metabolic syndrome N (%)	Not having metabolic syndrome N (%)		
Male	83 (37.4)	139 (62.6)	222 (100.0%)	0.000

Discussion:

This study demonstrated that frequency of metabolic syndrome in acute myocardial infarction according to modified NCEP ATP III was 37.4% in males. The mean±SD age of AMI patients was 53.51±11.63 years which are the same as the study conducted by Prashant Joshi⁹ *et al.* 2010. Among the male patients highest percentage was in the age group 51-60 years (31.1%) followed by 41-50 years (27%) and then age group >60 (24.3%). These data showed that acute Myocardial infarction patients was more in age group >40 years.

Fatal acute myocardial infarction is more in South Asian countries at younger age groups as

compared to European or Chinese ethnicity¹⁰. The younger age of first exposure with AMI may be due to higher frequency of components of metabolic syndrome in this region.

Higher rates of abdominal obesity appears to be due to lower physical activity⁹. Alberts¹ *et al.* stated that the metabolic syndrome cannot be taken as the sole risk for coronary artery disease because other risk factors like age, sex, smoking and LDL cholesterol levels are not included in the constellation. Patients with metabolic syndrome are at twice the risk of developing heart disease over the next 5 to 10 years as individuals without the syndrome¹¹.

Conclusion:

Frequency of metabolic syndrome in AMI patients was high in comparison to individuals without the syndrome. Abdominal obesity and high blood pressure was the more frequent components in metabolic syndrome patients in AMI.

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