

# Acute Myocardial Infarction: Clinical Variability among Hospitalized Patients

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## ABSTRACT

**Aim:** To determine characteristics, clinical features, modes of presentation & triggers of acute MI.

**Design:** Case series.

**Place and duration of study:** Department of Cardiology and CCU Bahawal Victoria Hospital Bahawalpur from 1<sup>st</sup> April 2010 to 31<sup>st</sup> March 2011.

**Patients and methods:** In this study, 1500 patients hospitalized for acute myocardial infarction, were enrolled. The diagnosis of acute myocardial infarction was based on characteristic clinical features, ECG findings and cardiac enzymes after exclusion of other possible alternative diagnosis.

**Results:** The study was male dominated (n=1080, 72%). Mean age of presentation was 53±11 years. Majority of patients (90%) presented with typical chest pain and only 10% presented with atypical symptoms. At the time of presentation, 81% of patients were having normal examination and only 19% had signs of left ventricular failure (basal crepts, S<sub>3</sub> gallop). Normal electrographic rhythms were observed in 95% of the patients at the time of presentation.

**Conclusion:** Majority of sufferers of MI are males. Smoking is the major risk factor. Majority of the patients presented with typical symptoms within a suitable time.

**Key words:** AMI, STEMI, NSTEMI, CAD

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## INTRODUCTION

Patients with chest pain represent a large and increasing proportion of all acute medical presentations worldwide. Of all those presenting for evaluation, only a minority have acute coronary syndrome (ACS). Distinguishing which patients have ACS remains a diagnostic challenge. The principal pathophysiologic mechanism of ACS is myocardial under-perfusion, which is caused by atherosclerotic plaque rupture or erosion, with different degrees of superimposed thrombus. Electrocardiography (ECG) provides the initial classification. Patients are divided into those with persistent ST-segment elevation and those without persistent-ST segment elevation or non ST-elevation ACS (NSTEMI/ACS)<sup>1</sup>.

Cardiovascular risk factors for ischemic heart disease (IHD) and acute myocardial infarction (AMI) are on the rise in Pakistan<sup>2</sup>. Modifiable risk factors include Diabetes, smoking, hypertension, hyperlipidemia, sedentary life style, obesity, stress and depression. Non-modifiable factors are advancing age, male gender, family history of coronary artery disease (CAD), while menopause, and personality type being partly modifiable. Newly emerging risk factors include increased levels of high-sensitivity C-reactive protein (hsCRP)<sup>3</sup>, homocysteine, lipoprotein (a), fibrinogen, D-dimers,

Interleukin 6 and myeloperoxidases<sup>4,5</sup>.

With increasing affluence and facilities of life, there is a definite change in life style and there is more and more tendency for sedentary habits. Exercise and outdoor activities seem to have decreased. As a consequence, cardiovascular diseases like myocardial infarction and stroke have become the leading causes of morbidity and mortality in Pakistan. Dyslipidemias are being increasingly recognized as an important contributory factor towards the development of coronary vascular disease (CVD). Framingham study showed that a 1% increase in total cholesterol cause 2% increase in the incidence of IHD<sup>6,7</sup>.

Our study focused the patients with ST-segment elevation myocardial infarction (STEMI) as well as non ST-segment elevation myocardial infarction (NSTEMI), to determine the modes of presentation of AMI and its risk factors.

## PATIENTS AND METHODS

This was prospective study which was conducted in our unit from 1<sup>st</sup> April 2010 to 31<sup>st</sup> March 2011. In this study, 1500 consecutive cases presenting with typical chest pain and either with suggestive changes on ECG or a specific rise in serum cardiac enzymes were recruited. The diagnosis was based on the definition of myocardial infarction as coined by the American College of Cardiology and the European Society of Cardiology which considers MI as a typical

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rise in cardiac troponin T or I, or CK-MB, above the 99<sup>th</sup> centile for normal, with at least one of the following; ischemic symptoms, development of pathological Q-waves on the ECG, ischemic ECG changes (ST-segment depression or elevation) or coronary artery intervention e.g. PCI<sup>8</sup>.

Typical chest pain was defined as deep, substernal, pressure-like or tightness type of pain radiating to left or right chest, neck, jaw, shoulders, arms, epigastrium or sometimes upper back, lasting for minutes to hours, precipitated by exertion and relieved by rest or sublingual nitroglycerin<sup>9</sup>.

Hypertension was defined according to the 7th Report of the U.S. Joint National Commission on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7), and was considered as systolic blood pressure  $\geq 140$  mmHg and diastolic blood pressure  $\geq 90$  mmHG<sup>10</sup>.

A fasting glucose of greater than or equal to 7.0 mmol/l or a two hour glucose value of greater than or equal to 11.1mmol/l was considered as diabetes.<sup>11</sup>

Obesity was defined as body mass index (BMI)  $\geq 30.00$  kg/m<sup>2</sup>.<sup>11</sup> Lipid abnormalities were defined according to the recommendations of National Cholesterol Education Program (NCEP) Adult Treatment Panel III<sup>12</sup>.

Any patient who has been smoking at least one cigarette per day for at least one year was labeled as smoker. All those patients who were doing office job for at least 6-8 hours per day, most of which they were spending while sitting in the chair, or women who were spending most of the time at home but were not involved in doing routine household activities, and were not sparing time for brisk walk in the morning or evening time for at least 15-20 minutes for at least 5 days in a week were labeled to be having sedentary life style.

We recorded the demographic data including age, gender, weight, height and the other independent variables of the patients in a predefined proforma. The traditional cardiovascular risk factors (smoking hypertension, diabetes mellitus, dyslipidemia, sedentary life style obesity) were noted. The two modes of presentation (the typical i.e. chest pain, sweating and atypical i.e. pain in epigastric, neck and shoulder region or painless) and duration of symptom onset (0-6, 6-12, 12-24 and >24 hours) were documented. Clinically the patients were also evaluated for signs of left ventricular failure (third heart sound (S<sub>3</sub>) gallop and basal crackles). The regions of infarction (anterior, inferior and combination), rhythm disturbances (sinus vs atrioventricular (AV) blocks) were also documented. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 10.

## RESULTS

The study was male dominated (n=1080, 72%). Mean age of presentation was 53±11 years. Majority of patients (90%) presented with typical chest pain and only 10% presented with atypical symptoms. At the time of presentation, 81% of patients were having normal examination and only 19% had signs of left ventricular failure (third heart sound gallop, basal crepts). Normal electrographic rhythms were observed in 95% of the patients at the time of presentation. Data regarding risk factors, family history, time of presentation after the first onset of symptoms and the region of infarction is shown.

Fig.1 Time of presentation after the onset of symptoms

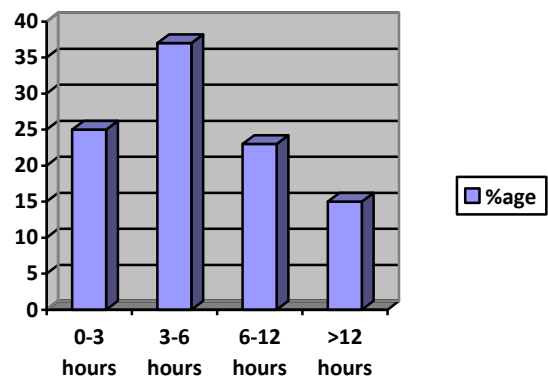


Fig.2: Regions of infarction

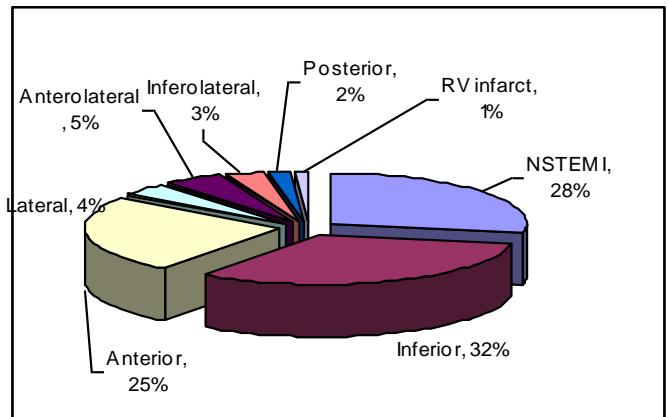


Table 1: Risk factors among the patients

Risk Factors	% age
Smoking	56
Hypertension	53
Diabetes mellitus	42
Dyslipidemias	20
Sedentary life style	30
Obesity	32

Table 2: Risk factors in the family

Risk Factors	% age
Hypertension	48
IHD	40
Diabetes mellitus	35
Stroke	07
Dyslipidemia	01
No significant family history	20

## DISCUSSION

The relative importance of coronary heart disease varies across regions and from country to country<sup>13</sup>. The disease is very common in westernized populations, affecting the majority of adults over the age of 60 years, but it is on rise in developing countries as well. Patients with ischemic heart disease fall into two large groups: patients with chronic coronary artery disease and patients with acute coronary syndrome (unstable angina and acute MI)<sup>14</sup>. Depending on the distribution of affected coronary artery, acute MI can produce a wide range of clinical sequelae, varying from a small clinically silent region of necrosis to a large overwhelming area of infarcted tissue resulting in cardiogenic shock and death. Our study focused on the various presenting parameters of acute MI<sup>15</sup>.

There was a clear male preponderance (72%) in our study, which is in agreement with Shahid Hafeez et al<sup>2</sup> (78%), suggesting that it is predominantly a disease of men. The mean age of presentation was 53±11 years which is in agreement with that reported by Maqbool Jafary et al (52±10.8 years)<sup>16</sup>. Smoking (56%), diabetes (42%) and hypertension (53%) were indeed the leading risk factors. Smoking is in fact a leading preventable risk factor for a long list of chronic diseases<sup>17</sup> including coronary vascular disease. The majority of patients (94%) presented with typical symptoms of chest pain in accordance with another study (98%) conducted by Khan et al<sup>18</sup>. Inferior wall myocardial infarction was commonest form which was in agreement with Ranjith et al<sup>19</sup>.

## CONCLUSION

It can be inferred that majority of sufferers of coronary artery disease (CAD) are males. Smoking, hypertension and diabetes are the major risk factors for CAD and inferior wall MI is very common form of STEMI.

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