

# Clinicoepidemiological Profile of Acute Myocardial Infarction Patients Admitted in a Tertiary Care Hospital of Tripura

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## Abstract

**Introduction:** Acute myocardial infarction is one of the leading causes of morbidity and mortality throughout the world, which has raised considerable interest in recent years. It is a significantly raising problem, particularly in India, in young as well as in elderly patients. The current study was conducted to assess the role of various clinicoepidemiological determinants of myocardial infarction.

**Aim and Objectives:** The aim of this study was to estimate the clinicoepidemiological profile of acute myocardial infarction patients admitted to Agartala Government Medical College and GBP Hospital.

**Methodology:** A cross-sectional hospital-based study conducted in the Department of Medicine, Agartala Government Medical College and GBP Hospital, Agartala within a period of January 2020 to June 2020. Data were analyzed by SPSS software version 15 using appropriate statistical tests.

**Results:** Male preponderance was observed in this study. The male-to-female ratio was 5:1. The age distribution of these patients ranged from 35 years to 85 years with maximum number of patients in the age above 60 years. Hypertension was present in 46% of the patients. About 45% of the patients were alcoholics in this study. About 27% of the patients were diabetics in this study. About 24% of the patients had hypercholesterolemia. About 19% of the patients in this study were obese. Tobacco smoking was present in 9% of the patients. Seventeen patients had blood pressure more than 160/90 mmHg at presentation with breathing difficulty, along with fourth heart sound, bilateral basal crepitations suggesting left ventricular failure. Twenty-seven patients had bradycardia, seven patients had second-degree heart block six complete heart block, and three patients had first-degree heart block. Five patients had ventricular fibrillation and died. One hundred and seven patients had chest pain as a presenting symptom. ST-segment elevation myocardial infarction (STEMI) was found among 63% of patients. About 37% of patients had non-ST segment elevated myocardial infarction (NSTEMI). Inferior wall myocardial infarction consists of 34%, anteroseptal wall myocardial infarction 22%, anterolateral wall myocardial infarction 15%, lateral wall myocardial infarction 10%, posterior wall myocardial infarction 8%, anterior wall myocardial infarction 8%, and septal wall myocardial infarction 3% of patients. Trop I positivity was observed among 120 patients.

**Conclusion:** A total of 120 consecutive cases of acute myocardial infarction admitted to AGMC and GBP hospital were selected for the study. Several conventional risk factors for myocardial infarction were identified, which included hypertension, diabetes, alcohol consumption, dyslipidemia, smoking, obesity, and among them, hypertension (46%) and alcohol consumption (45%) seem to be the most common risk factor contributing to acute myocardial infarction in the study population. The age of the patients ranged from 35 years to 85 years with elderly patients most commonly affected. STEMI was found among 63% of patients. The predominant sites of infarction were an inferior wall, anteroseptal wall, and anterolateral wall. Probably, the left coronary artery was mostly affected, followed by right coronary artery. Large case-control studies are needed to stratify, in which conventional risk factor independently contributes the most in the occurrence of coronary artery disease.

**Key words:** Acute myocardial infarction, Non-ST elevated myocardial infarction, ST elevated myocardial infarction, Trop I: Cardiac troponin I

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## INTRODUCTION

Acute myocardial infarction is the most common diagnosis in hospitalized patients in industrialized countries. In the United States, approximately 660,000 patients experience a new AMI, and 305,000 experience a recurrent AMI each year.<sup>[1]</sup> Acute coronary syndrome is an important global

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cause of death and also the major cause of morbidity and mortality in India.<sup>[2]</sup> A meta-analysis of prevalence studies done in India reported a 300% rise in the incidence of myocardial infarction for the past 50 years.<sup>[3]</sup> A 111% rise in deaths due to cardiovascular diseases in India has been predicted by 2020.<sup>[4]</sup> Changing in risk factors was observed in the period of 1990 to 2010. In 1990, the leading risks were childhood underweight 7.9%, household air pollution from solid fuels 6.8% and tobacco smoking including second-hand smoke 6.1%. In 2010, the three leading risk factors for global disease burden were high blood pressure 7.0%, tobacco smoking including second-hand smoke 6.3% and household air pollution from solid fuels 4.3%.<sup>[5]</sup> In India, out of all deaths, nearly 24.8% of deaths are due to cardiovascular diseases as estimated by the global burden of disease study (2010). The average age-standardized death rate in India due to cardiovascular disease is 272 per 100,000 population which is much higher than the rate of global deaths, that is, 235 per 100,000 population.<sup>[6]</sup> Worldwide, the prevalence of coronary heart disease (CHD) is increasing, although there are regional variations due to the influence of economies, industrialization, and advancement in health-care systems.<sup>[7]</sup> In Urban India, CHD prevalence in adult has increased considerably and occurred at a much younger age as compared to North America and Western Europe.<sup>[2]</sup> Hospital mortality in various parts of the state has been reported to vary greatly, and it may be related to differences in the severity of the cases and differences in the quality of medical treatment. Myocardial infarction is a multifactorial non-communicable disease. Considering all that, this study aimed at analyzing the clinical and epidemiological profile of a representative sample of acute myocardial infarction treated at AGMC and GBP hospital.

### Aim and Objectives

The aim of this study was to estimate the clinicoepidemiological profile of acute myocardial infarction patients admitted to Agartala Government Medical College and GBP Hospital.

## METHODOLOGY

A cross-sectional hospital-based study (IPD) at the Department of Medicine, Agartala Government Medical College and GBP Hospital and study duration is of 6 months.

### Inclusion Criteria

Patients satisfying the WHO definition<sup>[8]</sup> for diagnosis of myocardial infarction patients were included in the study.

The diagnosis was based in the presence of at least two of the following-

1. A clinical history of ischemic type chest discomfort
2. Changes in serially obtained electrocardiographic tracings
3. A rise and fall of serum cardiac markers.

### Exclusion Criteria

Nil.

The first electrocardiogram (ECG) was recorded at the earliest after admission and subsequently at 8 hourly intervals on the 1<sup>st</sup> day, daily for the next 7 days and thereafter as per need. If thrombolytic therapy was given, 12 lead ECG was recorded before and after the thrombolytic therapy. Right ventricular leads were recorded whenever deemed necessary (in patients with inferior wall MI).

The other investigations to which the patients were subjected are as follows:

- Blood routine (hemoglobin percentage, total count, differential count, and erythrocyte sedimentation rate)
- Random blood sugar and fasting blood sugar/post-prandial blood sugar were done whenever necessary, blood urea and serum creatinine
- Lipid profile.

### Special Investigations

- a. Echocardiography (2D) was done to confirm a myocardial infarction
- b. Chest X-ray/screening (whenever required).

### Limitation of the Study

A coronary angiogram is not done due to a lack of facility.

Patients were classified on particular aspects as follow:

WHO Asian BMI classifications:

- Underweight - <18.5 kg/m<sup>2</sup>
- Ideal - 18.5–23 kg/m<sup>2</sup>
- Overweight - 23–27.5 kg/m<sup>2</sup>
- Obese - >27.5 kg/m<sup>2</sup>.

### Socio-economic Status

As per modified B.G Prasad's classification for 2013 socioeconomic status upper class was classified those who have income 5156 and above.

Middle class was classified in to three parts

Part II of income between Rs 2578-5155

Part III of income between Rs 1547-2577

Part IV of income between Rs 773-1546

Lower class have income below Rs 773.

### Study Population

Patient those will be diagnosed to have acute myocardial infarction admitted at Agartala Government Medical College and GBP Hospital during this study duration, will be included in the study.

Modified B. G. Prasad's classification for 2013.	Class	Per capita income
<b>Socioeconomic status</b>		
Upper class	I	Rs 5156 and above
Middle class	II	Rs 2578–5155
	III	Rs 1547–2577
	IV	Rs 773–1546
Lower class	V	Below Rs 773

**Sample Size**

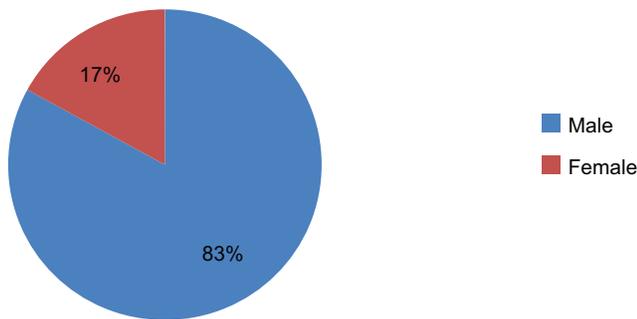
All the patients suffering from acute myocardial infarction admitted to Agartala Government Medical College and GBP Hospital following inclusion and exclusion criteria will be included in the study. From the previous records, it is found that in 1 year; approximately 240 patients were admitted at the medicine department. Hence, 120 patients were enrolled in this study.

**Sample Technique**

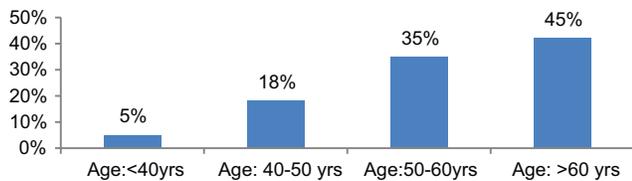
No sampling technique is required as approximately all the patients diagnosed with acute myocardial infarction have been included in the study.

**RESULTS**

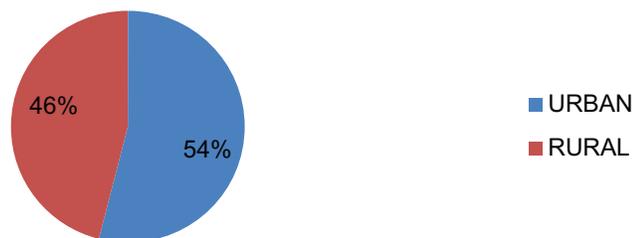
**Sex-wise distribution**



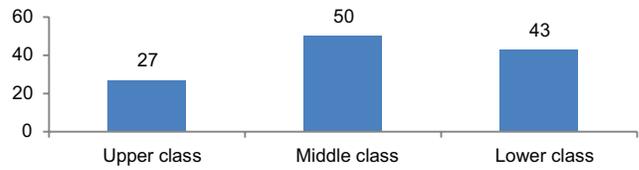
**Age-wise distribution**



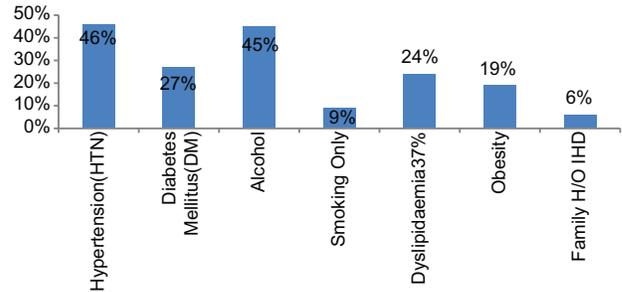
**Urban versus rural**



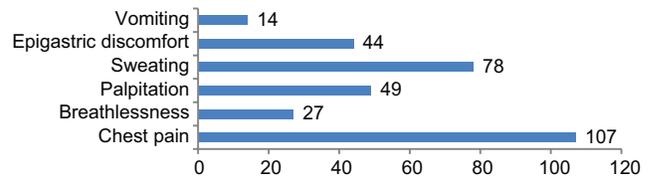
**Socio-economic status**



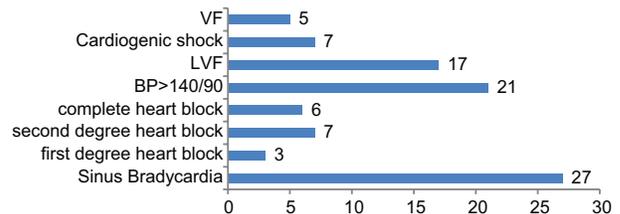
**Risk factor associated with acute myocardial infarction**



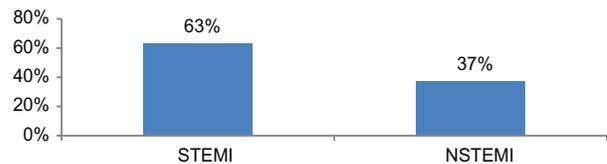
**Clinical presentation of acute MI**



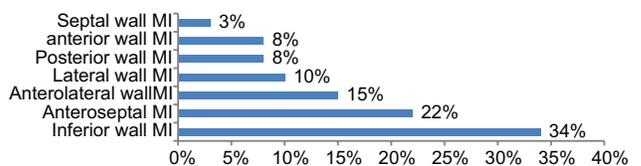
**Clinical and ECG findings**



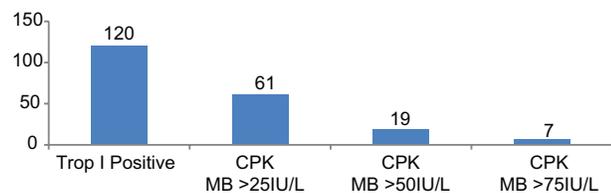
**ST-segment elevation myocardial infarction (STEMI) versus non-ST segment elevated myocardial infarction**



**ECG findings**



## CPK MB and Trop I positivity



## DISCUSSION

One hundred and twenty cases of acute myocardial infarction were admitted in AGMC and GBP Hospital, Agartala, between January 2020 and June 2020, and the results have been compared with other studies.

The age distribution of these patients ranged from 35 years to 85 years with 42% of patients in the age above 60 years. Seetharama *et al.*<sup>[9]</sup> study reveals 22% in the above 60 years.

There were 100 males (83%) and 20 females (17%) in the present study. The male-to-female ratio was 5:1. This findings are consistent with that of Seetharama *et al.*<sup>[9]</sup> (2015) 4.5:1.

The current study shows that hypertension was present in 46% of the patients. This finding correlates with that of Walia *et al.*<sup>[10]</sup> who have reported hypertension as a risk factor in 43.6%.

About 45% of the patients were alcoholics in this study. Narang *et al.*<sup>[11]</sup> study revealed that 44% of patients were alcoholics.

About 27% of the patients were diabetics in this study. This is comparable with studies of Steyn *et al.*<sup>[12]</sup> who have reported diabetes as a risk factor in 23.6%.

About 24% of patients in the present study had hypercholesterolemia. This correlates with the study of Bhattacharya<sup>[13]</sup> who have reported it to be present in 21.43% of the patients.

About 19% of patients in this study were obese. According to Majeed *et al.*,<sup>[14]</sup> obesity is a risk factor in 15% factor.

Smoking was present in 9% of the patients. This finding correlates with that of Walia *et al.*<sup>[10]</sup> who have reported a risk factor in 7.5%.

Seventeen patients had blood pressure patients more than 160/100 mmHg at presentation with breathing difficulty, along with 4<sup>th</sup> heart sound, bilateral basal crepitations suggesting left ventricular failure.

Twenty-one patients had blood pressure more than 140/90 mmHg but <160/100 mmHg.

Seven patients were under inotropic support with low blood pressure.

Twenty-seven patients had bradycardia, seven patients had second-degree heart block six complete heart block, and three patients had first-degree heart block.

Five patients had ventricular fibrillation and died.

In the present study, 107 patients had chest pain as a presenting symptom. Kudenchuk *et al.*<sup>[15]</sup> have reported that 99 patients had chest pain.

Sweating was present in 78 patients. Palpitation was present in 49 patients. Forty-four patients had epigastric discomfort.

STEMI was founded among 63% of patients. About 37% of patients had non-ST segment elevated myocardial infarction (NSTEMI).

ECG findings shown that left coronary artery was commonly affected and ECG pattern revealed Inferior wall myocardial infarction among 34% patients, anteroseptal wall myocardial infarction among 22%, anterolateral wall myocardial infarction among 15%, lateral wall myocardial infarction among 10%, posterior wall myocardial infarction among 8%, anterior wall myocardial infarction among 8%, septal wall myocardial infarction among 3% patients.

Trop I positivity observed among 120 patients. CPK MB >25IU/L observed among 61 patients. CPK MB >50IU/L observed among 19 patients. CPK MB >75 IU/L observed among seven patients. CPK MB <25 IU/L observed among 37 patients.

## CONCLUSION

From the above study, several conventional risk factors for myocardial infarction were identified, which included hypertension, diabetes, alcohol consumption, dyslipidemia, smoking, obesity, and among them, hypertension (46%) and alcohol consumption (45%) seem to be the most common risk factor contributing to acute myocardial infarction in the study population. The age of the patients ranged from 35 years to 85 years with the elderly patients most commonly affected. There was a high male preponderance with male-to-female ratio being 5:1. There was no statistically significant difference in risk factors between rural and urban population. Chest pain (96%) was the most common presenting symptom. STEMI was

found among 63% of patients. The predominant sites of infarction were inferior wall, anteroseptal wall, and anterolateral wall. Probably, left coronary artery was mostly affected, followed by the right coronary artery, though coronary angiogram is required to locate the exact site of involvement. Large case-control studies are needed to stratify, in which conventional risk factor independently contributes the most in the occurrence of coronary artery disease. The present study highlights the immediate need to initiate measures for early detection of risk factors, to raise awareness of hypertension, diabetes, alcohol consumption, dyslipidaemia, tobacco smoking, and obesity among the general population and that the risk of myocardial infarction can be averted with dietary modification and a change in lifestyle.

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