

# Distribution of age, gender and body weight in AMI patients in a tertiary care center of Eastern India



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## ABSTRACT

**Background:** The leading cause of death in the world is coronary heart disease (CHD). In India, CHD manifests almost a decade earlier than in Western countries. Gender differences play an important role in the pathophysiology of AMI. Body weight and family history are claimed to be the indicators of relative risk of mortality. **Aims and Objective:** To look for the age and gender distribution pattern in patients with recent diagnosed AMI and to find out the association of some of the risk factors like BMI, family history. **Materials and Methods:** A descriptive study was conducted in a tertiary care hospital with 50 recent diagnosed AMI patients of either sex as cases after considering the inclusion and exclusion criteria. The biochemical parameters were measured by validated methods. **Results:** On statistical analysis, 58% of total AMI cases occurred before 50 years of age; out of which 18% belong to 31 - 40 years, 40% belong to 41- 50 years. Out of total 50 AMI cases, 60% is male and 40% is female. Obesity seen in 14% cases and 56% is overweight; 16% having positive family history. **Conclusion:** The study indicates a trend of early age onset AMI. Increased body weight and positive family history can be the risk predictors. It is suggested that younger age males and premenopausal women should not be ignored regarding the risk of MI. Further studies are required for verification.

**Key words:** Myocardial Infarction; Age; Gender; BMI; Obesity; Family history

## INTRODUCTION

Myocardial infarction (MI) is the fatal manifestation of coronary heart disease (CHD) and can present as sudden demise. The disproportionate rise in prevalence of heart disease among certain ethnic groups like people of Asian Indian origin is a matter to study and these people tend to get AMI at a younger age in addition to more complex coronary artery abnormalities.<sup>1</sup> The disease carries a significant morbidity, psychological effects and financial constraints for the person and the family when it occurs at a young age.

The prevalence of risk factors is on the rise in young adults due to on growing westernized culture like smoking, obesity

and lack of physical activity.<sup>2</sup> This will result in an increased disease burden in the near future. Even these would have an impact on the cardio protection offered by hormones like oestrogen in young women. Obesity is a growing concern among young adults and children and it has increased by many folds in the past two decades.<sup>3</sup>

There are studies showing patients presented with acute MI in their 30s and 40s in western society.<sup>4</sup> In our set up there is lack of published data which can dictate the current trend of preponderance of suspected MI in which age group and guide the practical issues involved in their management. The statistics in young patients may be lower than actual because of atypical presentation

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and a delay for further investigations.<sup>5</sup> Better outcome among comparatively young age group can be given when the appropriate investigations and timely treatment are offered.

There are several well documented modifiable risk factors like serum lipids, lipoproteins, hypertension (HTN), diabetes Mellitus (DM), smoking and tobacco chewing etc. Non modifiable risk factors are age, sex, genetics, and family history. In this study, we have focused on some of the non-modifiable risk factors. The primary objective of the current study was to look for the pattern of the age and gender distribution among AMI cases admitted in a tertiary care hospital in North Kolkata, West Bengal; Secondary objectives were to study the association of the BMI and positive family history with the cases.

## MATERIALS AND METHODS

A total of 100 subjects, 50 AMI patients and 50 healthy controls were selected for the study. The patients in the study group were diagnosed with AMI at Emergency by clinical manifestations, ECG changes and by cardiac biomarkers like CPK-MB, Troponin T and were admitted in cardiology department.<sup>6</sup> The study design was pre-approved by the ethical committee of the institute. All participants were properly explained and valid written consent were taken beforehand.

Control group was healthy people from the community. Patients diagnosed to have recent AMI, having no thrombolytic therapy, willing to give valid consent were included in the study.

There were some exclusion criteria like previous history of MI or any other heart disease, any systemic inflammatory disease, cancer.

The study was a Cross sectional, descriptive, observational one. Overweight was defined as body mass index (BMI) greater than 25 kg/ m<sup>2</sup>. Obesity was defined as BMI greater than 30 kg/ m<sup>2</sup>. Waist circumference more than 102 cm was considered as high.

### Statistical Analysis

Statistical analysis was performed using Statistical Package for the Social Sciences, SPSS 20. The quantitative data were evaluated whether they followed the normal distribution. The basis to declare a certain parameter as normally distributed was  $SD < \frac{1}{2} \text{ Mean}$ . Results were expressed as mean  $\pm$  SD as well as median (confidence interval) according to distribution of the data. Pie charts were made for categorical variables. Bar chart was used to display

counts of the categories of a nominal or ordinal variable with proper axis assignment.

## RESULTS

The Pie diagram showing age wise distribution of AMI cases is shown in Figure 1.

Maximum number of cases (40%) is in the range of 41-50yrs. Eighteen percent of AMI patients is below 40 years.

Comparative analysis of gender wise distribution of controls and cases is shown in Table 1.

Table shows in the control group, 52% of total is male and 48% is female; in the case group, 60% of total is male and 40% is female.

The Pie diagram of gender wise distribution of AMI cases is shown in Figure 2.

The distribution of body weight in the form of BMI in three categories (normal, overweight, obese) in each of the four age groups of AMI cases has been shown in bar diagram in Figure 3.

Out of 50 AMI cases, 15 have normal BMI, 28 have overweight BMI and 7 cases are obese. Maximum overweight

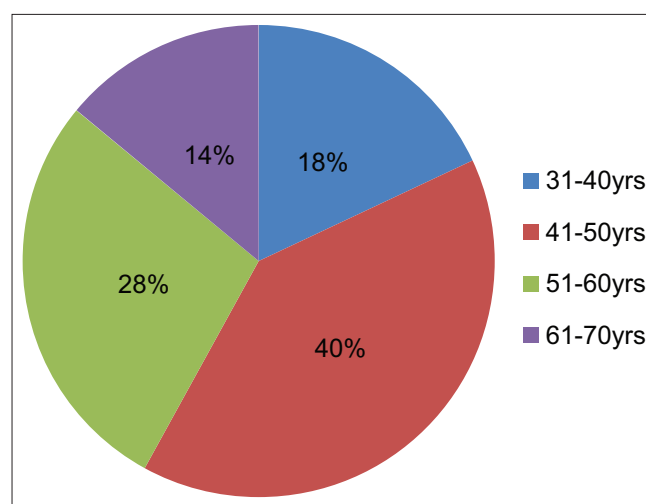
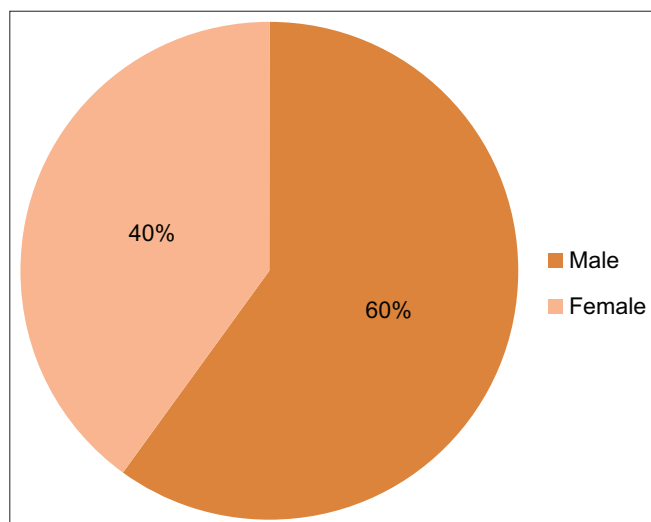


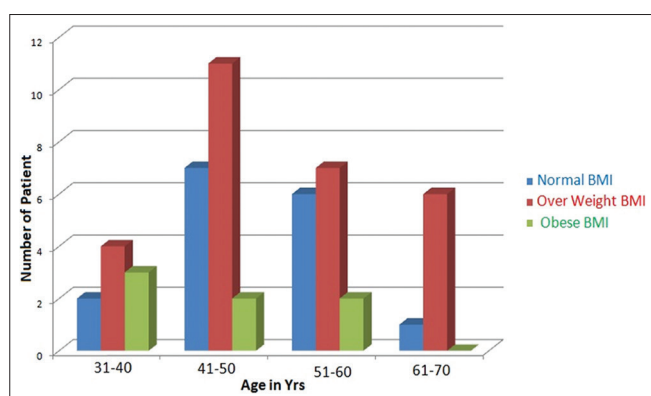
Figure 1: Age wise distribution of cases

Table 1: Gender wise distribution of controls and cases

Gender	Controls		Cases	
	No. of subjects	Percentage	No. of subjects	Percentage
Male	26	52	30	60
Female	24	48	20	40



**Figure 2:** Gender wise distribution of cases



**Figure 3:** Distribution pattern of BMI in AMI patients

cases are in the age group of 41-50 years and maximum no of obese cases are in the age group of 31-40 years.

Positive family history of coronary heart disease in first- or second-degree relatives is present in 16% cases of AMI. Out of which 62% is female and 38% is male.

## DISCUSSION

Coronary artery disease (CAD) is the new epidemic afflicting Indians at a young age, presenting with severe and diffuse form of lesions.<sup>7</sup> In our study, the age group 41-50 years having maximum no (40%) of recently diagnosed AMI patients; 18% in the age group of 31-40 years. The term “premature CAD” is applied to the occurrence of cardiac events before the age of 55 years in males and 65 years in females. Indians are afflicted with CAD about 5-10 years earlier than other ethnic groups, and have higher incidence of hospitalization, mortality and morbidity than comparable populations of other ethnicity.<sup>8</sup> Incidence of CAD in young Indians is about 12–16% as compared to the Western

population where it is  $\leq 5\%$ .<sup>9</sup> In North Kerala, one study put the incidence of first acute myocardial infarction (AMI) in Indians of less than 45 years to as high as 25–40%.<sup>10</sup>

One incidental finding in our study is that there were no female patients in the age group of 31-40 yrs. In this age group, we have recorded 9 patients who are all males out of which 3 patients have the positive family history as well as the obesity. So, it can be said that males are more prone to early age AMI; specially those who have the positive family history of CHD and carrying increased body weight. The age group of 41-50 years has the maximum no of AMI cases as well as maximum no of overweight patients. Increased body weight is an independent risk factor for CAD.<sup>11</sup>

## CONCLUSION

From the findings of the current study, it is suggested that younger age males and premenopausal women should not be ignored regarding the risk of MI and should be properly evaluated and screened if there is any sort of symptom or the presence of any risk factor. It will significantly contribute to the risk assessment of CHD and its prophylaxis at an early stage. Life style modification is very important from a very early age specially for those who have the positive family history and prone to be obese.

### Limitations of the study

Patients who died before hospital arrival were not included in our study and our overall finding has been compromised. The number of cases in one year study is not sufficient to draw a strong recommendation.

### What this study adds

Our study has been able to give an insight of the emerging trend of early coronary artery disease in Eastern India.

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**Authors contribution:**

**TK** - Concept and design of the study, collected sample and data, statistically analyzed and interpreted, literature search, manuscript preparation; **TM** - Concept and design of the study, Sample collection, critical revision of the manuscript; **MS** - Reviewed the literature, helped in preparing first draft of manuscript; **BM** - Concept of the study, review of the study.

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