

## Clinical Profile of Patients Presenting with Chest Pain to Emergency Department

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### Abstract

**Background:** Chest pain may be a symptom of a number of serious conditions and generally considered as a medical emergency. In ER the typical approach to chest pain involves ruling out the most dangerous cause and elimination or confirmation of the most serious cause, a diagnosis of the origin of the pain may be made. **Objective:** To study clinical profile of patients presenting with chest pain in emergency department. **Method:** This prospective observational study was performed on 71 patients who had presented with chest pain in emergency department of a tertiary care hospital in south India, Amrita Institute of Medical Sciences and Research Centre (Kochi). **Results:** In all 71 patients included in the study, the cause of chest pain was reliably determined. There was 57 (95%) males and 14 (5%) females included in the study. The median values are as follows age group (60), Heart rate (74), Mean Arterial Pressure (100), Oxygen saturation (98), Respiratory rate (20), Temperature (98) and Random blood sugar (98). **Conclusions:** In the 71 patients, the major cause of chest pain was cardiac in origin in 52 patients (73%) and remaining were non cardiac causes in 19 patients (27%). Among cardiac causes, ACS was found as the major cause of chest pain in 31 patients (43%) followed by other cardiac causes in 21 patients (30%).

**Keywords:** Chest Pain; Acute Coronary Syndrome; Emergency Room; Electrocardiogram.

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### Introduction

Chest pain is one of the most common reason for admitting patients to the emergency room. In emergency department the typical approach to chest pain involves ruling out the most dangerous causes: myocardial infarction, pulmonary embolism, thoracic aortic dissection, esophageal rupture, tension pneumothorax, cardiac tamponade etc. By elimination or confirmation of the most serious causes, a diagnosis of the origin of the pain may be made.

An acute coronary syndrome (ACS) needs to be distinguished from a variety of other cardiac and non cardiac disease that causes chest pain. In certain causes, a diagnosis can be made quickly, particularly in the case of an acute transmural myocardial infarction. Non ST elevation ACS, typically cause uncertainty [1].

Careful medical history and physical examination is essential in distinguishing dangerous and trivial cause of chest pain. Typically, patients are checked by a resident on duty in the emergency room and subsequently discussed with a supervisor. Based on a general impression, patient history, risk factors, ECG and level of cardiac enzymes, it is decided whether or not to admit the patient for clinical observation.

The diagnosis can be made quickly in case of concurrent typical changes in the electrocardiogram (ECG) and/ or increased level of cardiac enzymes in plasma.

An acute coronary syndrome needs to be distinguished from a variety of other cardiac and non cardiac disease that causes chest pain. In certain causes the diagnosis can be made quickly, particularly in the case of an acute myocardial infarction.

Some times as symptoms and presentation may overlap each other and it may be difficult for the primary physician to distinguish and come to a conclusion.

This study was conducted to investigate the common cause of chest pain presenting to emergency room.

### Methodology

#### Inclusion Criteria

Patient 18 years or above who had presented with chest pain in emergency department.

#### Exclusion Criteria

- Patients younger than 18 years of age.
- Traumatic chest pain
- Pregnancy

#### Structure, Material and location

This prospective observational study included 71 patients who had presented with chest pain selected from the emergency room of Amrita Institute of Medical Science and Research Centre from July 2015 to April 2016. All patients are stratified by priority using a risk stratification protocol-the triage system- performed by trained emergency medical technicians. We collected clinical information from the emergency department patients and analyzed the level of priority given, prior medical SAMPLE history, diagnostic test result and the final diagnosis. According to the diagnosis made by cardiologist, patients were divided into two groups: cardiac and non-cardiac patients.

#### Data collection

All relevant clinical data were extracted from the patients records including age, sex, cause of chest pain, pains score, type of pain, vital parameters includes: Heart rate, Blood pressure and Oxygen saturation. Investigations like Echo, ECG, Cardiac enzymes like Troponine I.

#### Statistical analysis

The data collected were compiled using Microsoft Excel. All statistical analyses carried out using IBM Statistical Package for Social Science (SPSS version 20). We used frequency and percentage to present categorical variable and median to present numerical variable.

### Result

This prospective observational study included 71 patients who had presented with chest pain to the emergency room of Amrita Institute of Medical Science and Research Centre from July 2015 to April 2016. Out of this 57 (83%) patients have normal heart rate, 8 (11%) patients had tachycardia. Among patients with tachycardia, one had atrial fibrillation; two had stable ventricular tachycardia and remaining five had sinus tachycardia. 4 (6%) patients had bradycardia. Among patients with bradycardia, one patient had third degree AV block and three patients had Sinus bradycardia. In this study 35 (49%) patients had hypertension, and 36 (51%) patients had normal blood pressure. Out of the patients who presented with hypertension, 10 patients were in Hypertensive urgency and hypertensive emergency patients were 5 in number. In the study we found that 31 (48%) of the patients had mild pain score, 34 (44%) patients have moderate pain score and 6 (8%) patients had severe pain score. Out of 71 patients, 21 (30%) of them presented with chronic chest pain whereas 50 (70%) patients presented with acute chest pain. Acute coronary syndromes included in the study are STEMI, NSTEMI and Unstable angina. On analysis we found that 9 (13%) patients had unstable angina, 17 (23%) patients had ST elevated myocardial infraction and 5 (7%) patients had non ST elevation MI. Among the cardiac causes of chest pain, 31 of patients were presented due to acute coronary syndrome and remaining 21 patients were presented with other cardiac causes such as: Atrial fibrillation, ventricular tachycardia, Atrio ventricular blocks etc. The final outcome of patients who came to emergency department, 5 (7%) patients were shifted to cathlab, 14 (20%) patients were shifted to ICU, 15 (21%) were shifted to CCU, 18 (25%) patients were shifted to ward and 19 (27%) patients were discharged.

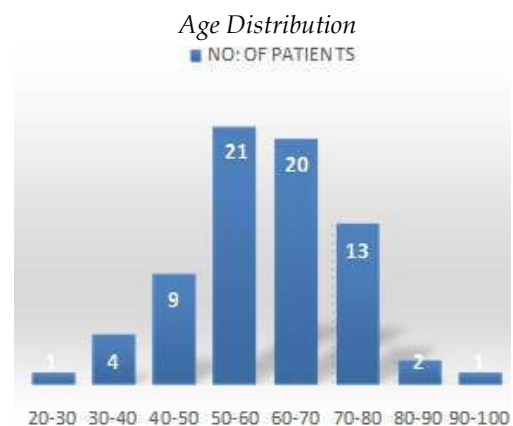


Fig. 1: Graph showing age distribution.

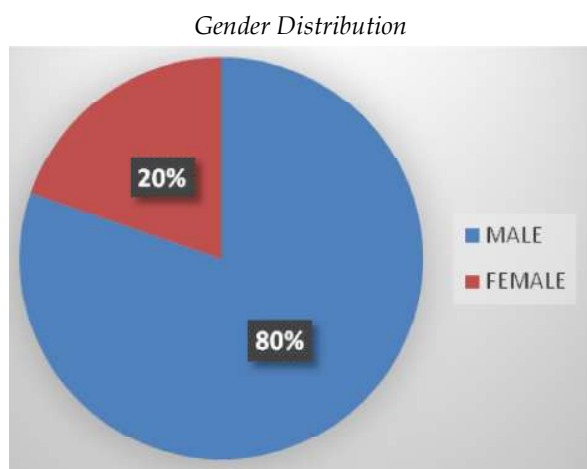


Fig. 2: pie diagram showing gender distribution.

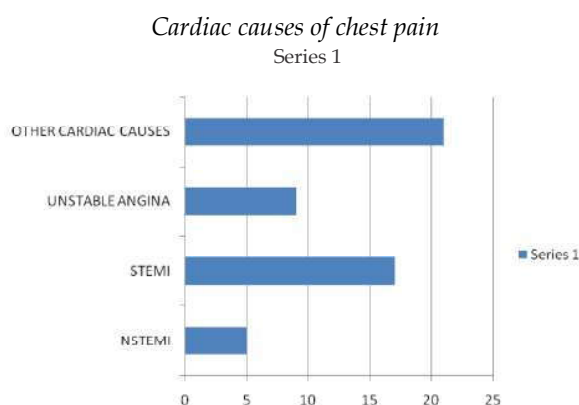


Fig. 3: Graph showing cardiac causes of chest pain.

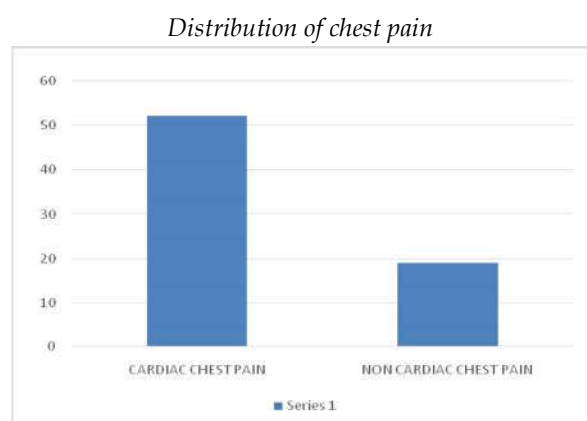


Fig. 4: Distribution of chest pain level in study group

## Discussion

The observations of the current study which included 71 cases of chest pain presenting to the Emergency Department of Amrita Institute of Medical Sciences and Research Centre.

In the present study we are discussing about the common cause of chest pain presenting to emergency room. In this distribution of age group between 20-100 years were included. The median of age group was 60. In the age group of 20-30, total number of patients presenting with chest pain was 1 (1%) which was a female patient. Between 30-40 years of age, four patients (5%) presented with chest pain and were male patients. In the age group of 40-50, total number of patients were 9 (13%) of which 8 (11%) were males and 1 (2%) was female. In the age group between 50-60, total number of patients presenting with chest pain were 21 (30%) of which 19 (26%) were males and remaining 2 (4%) were females. Between 60-70 years, total number of patients who presented with chest pain were 20 (29%) of which 15 (21%) of patients were male and 5 (8%) of patients were females. In between 70-80 years of age total number of patients were 13 (19%) of which 9 (13%) were males and 4 (6%) were females. In between 80-90 years, total number of patients who presented with chest pain were 2 (2%) out of which 1 (1%) was male and 1 (1%) was female. In between 90-100 years 1% of patients were presented with chest pain, and it was male.

In Figure 2 shows the total of 71 patients enrolled in the study in which, 57 (80%) were Males and 14 (20%) were Females.

### Definition of ACS

Chest pain patients in the emergency department create uncertainty for all treating physicians, in particular when no diagnosis is made. The diagnosis of nSTE-ACS may be easy to conform but is often hard to exclude [2]. Patients were randomized only when the diagnosis was confirmed by means of typical ECG changes and/or elevated troponin levels. Unconfirmed cases of ACS were ignored in such trials.

In the study, pain score is divided into three categories mild, moderate and severe. 0-3 mild, 4-5 moderate, >5 severe. In the study we found that 31 (48%) the patients had mild pain score, 34 (44%) patients have moderate pain score and 6(8%) patients had severe pain score. Out of 71 patients, 21 (30%) of them presented with chronic chest pain, 50 (70%) patients were with acute chest pain.

Acute coronary syndrome included in the study includes NSTEMI, STEMI and Unstable angina. The study result 9 (13%) patients had unstable angina, 17 (23%) patients had ST elevation myocardial infraction. 5 (7%) patients had non ST elevation MI. Among the cardiac causes of chest pain, 31 patients presented with acute coronary

syndrome and remaining 21 patients presented with other cardiac causes such as: Atrial fibrillation, ventricular tachycardia, Atrio ventricular blocks etc.

Among the 17 patients who were presented with chest pain due to STEMI. 10 (59%) patients had anterior wall myocardial infarction, 6 (35%) patients had inferior wall myocardial infarction and 1 (1%) patient had lateral wall myocardial infarction. According to this study the most common area affected was the anterior wall in an ST elevation myocardial infarction.

Previous studies on the value of the clinical assessment of patients with suspected Coronary Artery Disease have focused on studies based in emergency department [3,4,5], have reported the prognostic value of individual signs and symptoms [6,7,8] or include predictors not available on clinical history or examination, such as biomarkers [3,9].

Future studies may derive diagnostic tool, or validate [10] the ones presented in the review, in larger data sets and use more uniform measures for predictors and outcomes. Ideally the outcome to be used in future studies should include all clinically relevant cases of CAD rather than specific ones such as only angina or only myocardial infarction.

The guidelines from the European society of cardiology acknowledges that non-invasive, imaging-based diagnostic methods for CAD have typical sensitivities and specificities of approximately 85%, therefore 15% of all diagnostic results will be false. For this reason they recommend no testing if the probabilities of CAD estimated on clinical grounds are <15% or >85%, assuming that these patients are healthy or have stable CAD respectively [11].

In the included patients normal heart rate was considered between 60-100 beats /minute. More than 100 beats/minutes considered as tachycardia and less than 60 beats/minutes considered as bradycardia. 57 (83%) patients have normal heart rate. Out of 71 patients, 8 (11%) patients had tachycardia. Among this 8 patient one had atrial fibrillation; two had stable ventricular tachycardia and remaining five had sinus tachycardia. 4 (6%) patients had bradycardia. Among this three patients had third degree AV block.

In this study 35 (49%) patients had hypertension, and 36 (51%) patients had normal blood pressure. Hypertensive Urgency patients were 10 and Hypertensive Emergency patients were 5 in number.

The final outcome of patients who came to

emergency department, 5 (7%) patients were shifted to cathlab for Primary Intervention, 14 (20%) patients were shifted to ICU. 15 (21%) were shifted to CCU. 18 (25%) patients were shifted to ward and 19 (27%) patients were discharged. In short 5 patients were immediately shifted to cathlab for definitive management. 29 patient were shifted to Intensive Care Units and 18 were shifted to ward for stabilization and 19 were discharged.

In this retrospective observational study of 71 patients admitted in the Department of emergency medicine, we found that 52 (73%) of them experienced chest pain due to cardiac causes and 19 (27%) of them was due to non-cardiac causes.

### Conclusion

By this study we found that out of 71 patients who presented to the Emergency room with chest pain, in 52 (73%) patients the pain was cardiac in origin and the remaining 19 (27%) were non cardiac in origin. The study shows that 9 (13%) patients had unstable angina while 17 (23%) patients had ST elevated myocardial infarction and 5 (7%) patients had non-ST elevated myocardial infarction and 21(29%) had other cardiac causes. In the 17 (23%) causes who had ST elevated MI, 10 (14%) of patients had anterior wall myocardial infarction, 6 (8%) patients had inferior wall myocardial infarction and 1 (1%) of patient had lateral wall myocardial infarction. In conclusion as per this study cardiac causes remains the most common cause of chest pain for patients attending the Emergency department which is similar to other studies.

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