

Why Do Stemi(St Elevation Myocardial Infarction) Patients Present Late –Study In A Tertiary Care Hospital

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Abstract: We intended to study the prevalence and reasons for late presentation in STEMI in a metropolitan city like Chennai in our centre between May 2016 and April 2017 with a detailed questionnaire. Out of 1278 STEMI patients, 274(21.9%) patients presented late. The causes for late presentation were patient factors (51.8%), atypical symptoms (29.6%), delay in the first medical contact health centre(12.3%), non availability of ambulance (2.3%), traffic jams (2.2%) and non allopathic doctor consultation (1.8%). The most common cause for delay in the FMC centre was in the waiting hall or waiting for the ECG report. Even among the late presentors, the time delay was shorter in patients who came in ambulance compared to patients who arrived by themselves or other mode of transport.

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I. Background

Acute myocardial infarction (AMI) is a major health problem and despite the advances made in the diagnosis and management over the past two decades, it is not uncommon to miss the diagnosis or overlook early symptoms, both by the patient and the primary physician leading to delayed diagnosis and increased morbidity and mortality⁽¹⁾. It is well known that AMI can have varied presentations⁽²⁾. The classic symptom of chest pain is not always present and patients with AMI may have atypical presentations like dyspnoea, abdominal or epigastric pain, nausea, vomiting, syncope, etc. These atypical presentations are more common in the female and elderly group⁽³⁾. Understanding the atypical presentations may help in early identification and treatment of these patients with AMI where earlier the treatment better is the outcome. The importance of early management of acute coronary syndromes (ACS) has been recognised for many years⁽⁴⁾.

The pre-hospital delay (symptom-to-door time) includes the time required to recognise the symptoms by the patient, decision to take medical help, transport arrangement and travel to the hospital and may be related to various social factors such as level of knowledge, attitude and beliefs of patient and his family, time of symptom occurrence, and distance to the nearest hospital.

Our centre- Stanley Medical Hospital is located in North Chennai, one of the densely populated areas of Chennai. To understand the reasons for the delay in STEMI presentation, in our centre we proposed a prospective longitudinal observational study. Data obtained in such a study could help us to identify the grass root problems for delayed presentations in a metropolitan city which is not documented in any study to the best of our knowledge. It could also help the administrators to take the best measures for the benefit of the society.

II. Methods

The study was conducted on patients presenting with first STEMI to the department of cardiology, Stanley Medical College/Hospital, Chennai, Tamilnadu over a period of 1 year from June 2016 to April 2017.

Study Design: Prospective observational study

Study Location: This was a tertiary care teaching hospital based study done in Department of Cardiology, Stanley Medical College, Chennai-600001, Tamilnadu.

Study Duration: JUNE 2016 to APRIL 2017.

Subjects & selection method: The study was conducted on patients presenting with first STEMI to the department of cardiology, Stanley Medical College/Hospital, Chennai over a period of 1 year. Patients who presented up to 7 days of STEMI were included in the study.

Inclusion criteria:

- 1) Patients presenting with the first episode of STEMI after 12 hours of symptom onset.
- 2) Duration of STEMI more than 12 hours and less than 7 days.
- 3) All age group and sex were included.

4) Patients who presented with evolved STEMI even if less than 12 hours were also included.

Exclusion criteria:

- 1) Known CAD patients with recurrent ACS were excluded.
- 2) Patients with first STEMI but who were admitted and treated elsewhere and then referred here for further management.
- 3) Duration unknown or more than 7 days.
- 4) Patients who didn't consent to participate in the study.

METHODOLOGY:

After written consent from the patient and attender, every patient was interviewed separately with a well developed questionnaire and details of the events right from the onset of symptoms were recorded. The following details were recorded for each patient:

- 1) Geographical location
- 2) Demography of the patient
- 3) Time of onset of symptoms
- 4) Presenting symptoms including atypical symptoms.
- 5) Details of transport to the FMC(First Medical Centre) or our centre.
- 6) Average time taken to get an ambulance (108 ambulance service in Tamilnadu or private ambulance)
- 7) Average time spent in the FMC.
- 8) Details of events in the FMC
- 9) Door-in and door-out time in FMC
- 10) Consulted by a duty doctor/primary physician/ non allopathic practitioner
- 11) Door to diagnosis time for each patient.
- 12) Known/unknown risk factors.

III. Results

Over a period of one year, 1248 STEMI patients were admitted in our hospital, out of which 274(21.9%) patients presented late- either after 12 hours of symptom onset or with evolved STEMI.

DEMOGRAPHY:

Out of 274 late presentors, 55.5% were male and 44.5% were females. Young males (<40) and old females>70 yrs had a tendency to present late. The mean age of late presentors was 55.4yrs.

Table -1

SEXWISE DISTRIBUTION OF LATE PRESENTORS		
MALE	FEMALE	TOTAL
152 (55.5%)	122(44.5%)	274
SEXWISE DISTRIBUTION OF EARLY PRESENTORS		
M	F	TOTAL
531(54.5%)	443(45.4%)	974

Table-2

AGEWISE DISTRIBUTION OF LATE PRESENTORS										
<39		40-49		50-59		60-69		>70		MEAN AGE
M	F	M	F	M	F	M	F	M	F	
8	0	29	19	47	45	43	68	3	12	55.4 yrs

SYMPTOM ANALYSIS:

Chest pain was the most common symptom in 70.4% patients. However 43 out of 274 patients 15.6% of patients had atypical chest pain like pain in the back, shoulder or arm alone. Dyspnea was the only symptom in 4.7% of patients and syncope was the presenting symptom in 0.7% of patients. 2patients(0.7%)presented with palpitation and was found to have VT and 1 patient was admitted with drowsiness and unresponsive rate with a misdiagnosis of CVA.(0.4%)

Table -3

PRESENTING SYMPTOM IN ACUTE MYOCARDIAL INFARCTION-STEMI LATE PRESENTORS	
CHEST PAIN with/without other symptoms	193 (70.4%)
Atypical chest pain (shoulder, back pain, arm pain alone)	43(15.6%)
Dyspnea only	13(4.7%)
Nausea, vomiting only	10(3.6%)

Epigastric pain	10(3.6%)
Syncope only	2(0.7%)
Palpitation only	2(0.7%)
Unconscious state	1(0.4%)

PATIENT AWARENESS:

A pre existing awareness and knowledge of GOLDEN HOUR in STEMI was present only in 5% of patients. Although 85% of patients have known about MI they were not aware of the concept of golden hour .

RISK FACTORS:

The most common modifiable risk factor in our study among the late presentors was diabetes mellitus(56.3%) followed by hypertension (33.3%) and dyslipidemia (10.5%). Smoking was present in (45%) of male late presentors. A positive family h/o premature CAD was present only in 2% (5 patients)of late presentors. Among the patient with risk factors like Diabetes, hypertension and dyslipidemia ,only31% of patients were aware of their risk factor.

Table-4

RISK FACTOR	TOTAL NO OF PATIENTS	AWARE	UNAWARE
DIABETES only	154(56.3%)	62(40.2%)	92(59.8%)
HYPERTENSION	91(33.2%)	23(25.3%)	68(74.7%)
More than 1 risk factors	29(10.6%)		

PRE HOSPITAL DELAY:

The average symptom to diagnosis time in late presentors was 15.4 hours.

Table-5

Less than 12hrs	12hrs-24hrs	>24 hrs
52(18.9%)	201(73.4%)	21(7.6%)

AMBULANCE SERVICES:

Only 169 (13.5%) patients of the total 1248 STEMI patients used ambulance service to reach the hospital. Among the 274 late presentors, only 12 (4.3%) arrived in ambulance to the hospital.The average ambulance response time was 15.6minutesEven among the late presentors, patients who came by ambulance had a mean presenting time of 14.3 hrs and those who came by themselves had an average presenting time of 17.7hrs..

Table-6

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total no of STEMI patients	1248
total no of STEMI patients who arrived by ambulance	169 (13.5%)
mean presenting time of early presentors in ambulance	4.5 hrs
mean presenting time of late presentors in ambulance	14.3 hrs.

DIDO(Door In Door Out) TIME IN THE FIRST FMC

155 (56.6%) patients presented directly to our hospital and the remaining 119 (43.4%) patients visited a nearby clinic/hospital before being referred to our hospital. The average time taken for the FMC was 16.1hrs. The average DIDO time in the FMC was 43 minutes which is still greater than the recommended time of 30minutes. The greatest delay occurred in the waiting hall of the hospital or waiting for the ECG report.

Table-7 (CAUSES FOR LATE PRESENTATION)

Total admissions with STEMI- 1248	
Total late presentors - 274 (21.9%)	
Late presentation due to patient factors	142 (51.8%) Unaware of symptoms of heart attack -92 (64.8%) Dependent senior citizens > 65yrs of age -24(16.9%) Widower-12 (8.5%) Young active male <40yrs of age-2 (1.5%)
Late presentation due to delay in the first medical contact(FMC) health centre	33 (12.3%) Seen by duty doctors -27(81.8%) Seen by primary physicians-6(18.2%). ECG was taken only in 7(21%) Greatest delay occurred in the waiting hall of the doctor-45.6% followed by delay in waiting for ECG and ECG report-22.3%
Late presentation due to atypical symptoms	81(29.6%)

Non availability/delay of ambulance	7 (2.3%)
Traffic jams	6 (2.2%)
Non allopathic doctor consultation	5(1.8%)
Average door to diagnosis time in late presentors	presenting in ambulance- 14.34hrs presenting by themselves – 17.7 hrs (significant p<0.01)

IV. Discussion

The prognosis in MI is directly dependent on the rapidity of the initiation of reperfusion therapy be it thrombolysis or PCI but longer the delay, worsen the outcome. In our study 21.9% of STEMI patients presented late and 78.1% were taken up for reperfusion strategy. Young males tend to present late and all our 8 patients(<39yrs) were treated as non cardiac chest pain or Peptic ulcer disease. Similarly old dependant females and males had increased incidence of late presentation. In our study, out of 1248 patients 565 (45.2%) were female patients. Only 3.4% of females (19 patients) were pre menopausal. Out of these 19 pts, 18 had diabetes and 1 was due to coronary artery dissection.

Another important observation in our study is that, even in a metropolitan city only 5% of our patients had an awareness about the concept of golden hour in AMI. Though 85% of patients have known about AMI the more important details like which hospital should they go for treatment and how early they have to reach a hospital are not known to 95% of patients.

The next important reason for the delay in our study is the iatrogenic delay or misdiagnosis in the FMC centre. Nearly 82% of the patients who visited FMC other than our hospital were seen by duty doctors especially in the nights and misdiagnosis and attributing the premonitory symptom to another disease is common. Also, the average DIDO time in the FMC centre was 43 minutes which is still greater than the recommended time of 30 minutes. So, although patient related factors are the most common cause for the late presentation, there is also a small lacuna on the part of the treating primary physicians in causing the delay in the treatment of STEMI. Primary care physicians had to be trained about the possibility of varied presentations of STEMI, in identifying STEMI in ECG and also the need for early referral and reperfusion strategy.

Atypical symptoms were present in 29.6% of the late presentors and is also a common cause for patient's denial and misdiagnosis of STEMI by primary physicians. This can be rectified only by good awareness and public educational programmes and physician training programmes.

Another factor is that ambulance services were underused primarily due to the unawareness or difficulty in contacting them. Only 13.5% of our STEMI patients arrived in ambulance. Since ours is a densely populated area direct presentation would have been more easier for the patients than waiting for the ambulance. This could have also been the reason for underutilization of ambulance services. The average 108 response time in our study was 15.6 minutes which has to be brought down in future.

Similarly, nearly 69% of STEMI patients who presented late were unaware of their modifiable risk factors of STEMI implying that we need more screening programmes for the detection of risk factors in the society so that primary prevention becomes more important rather than secondary prevention.

V. Conclusion

Health centres including private clinics, nursing homes and govt health centres are easily available in a metropolitan city like Chennai. Still 21.9% of patients present late in STEMI. Patient factor followed by missed/late diagnosis at the FMC centre and atypical presentations contribute more than 80% of late presentation. Hence increasing public awareness, special chest pain preference/referral protocols in all health care centres to decrease door in door out time, training of all primary care physicians (PCP), establishing communication between the PCP and tertiary care duty cardiologists and more early and effective use of 108 ambulance services can cause a dramatic sea change in the outcome of STEMI in a metropolitan city.

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