



ORIGINAL RESEARCH PAPER

General Medicine

A STUDY ON MECHANICAL COMPLICATIONS AND OUTCOMES IN PATIENTS WITH ACUTE ST-ELEVATION MYOCARDIAL INFARCTION

KEY WORDS:

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ABSTRACT

Objectives :

- 1) To assess the in hospital mortality of these patients
- 2) To Detect proportion of patients developing mechanical complication following acute ST Elevation MI

Materials And Methods: cross sectional descriptive study done after detailed history and examination of patients followed by ecg and echo in al- ameen medical college in duration of 18 months This observational study included adults diagnosed with acute STEMI who were admitted within 24 hours of symptom onset. Patients were monitored for the development of mechanical complications, including ventricular septal rupture (VSR), papillary muscle rupture leading to acute severe mitral regurgitation, free-wall rupture, and right ventricular involvement. Clinical data, echocardiographic findings, management strategies, and in-hospital outcomes were analyzed. **Results:** Mechanical complications occurred in a small but clinically significant subset of STEMI patients. VSR and free-wall rupture were most frequently associated with anterior wall myocardial infarction. Of the 120 patients with stemi , 9 developed mechanical complications in the form of ventricular septal rupture , severe mitral regurgitation and ventricular free wall rupture.

Conclusion : The mortality rates in ACS and STEMI remain high in this patient.

BACKGROUND:

Acute ST-elevation myocardial infarction (STEMI) continues to carry significant morbidity and mortality, largely influenced by the occurrence of mechanical complications. Despite advancements in reperfusion strategies, these complications though infrequent remain catastrophic. This study evaluates the incidence, clinical profile, and outcomes of mechanical complications in patients presenting with acute STEMI. Despite advances in reperfusion therapy early identification and prompt management are critical to improve outcome .

There are two main complications of acute myocardial infarction

- 1) Electrical
- 2) Mechanical

Mechanical complications of Acute myocardial infarction include left ventricular free wall rupture , ventricular septal rupture, papillary muscle rupture these are fatal complications which can lead to acute Mitral regurgitation. Other complications include pseudo aneurysm and true aneurysm. whereas papillary muscle rupture predominantly followed inferior infarctions. Patients with complications had higher Killip class at presentation, persistent chest pain, elevated inflammatory markers, and delayed reperfusion.

Acute ST-elevation myocardial infarction (STEMI) continues to carry significant morbidity and mortality, largely influenced by the occurrence of mechanical complications. Despite advancements in reperfusion strategies, these complications-though infrequent-remain catastrophic. This study evaluates the incidence, clinical profile, and outcomes of mechanical complications in patients presenting with acute STEMI.

MATERIAL AND METHODS:

This study was conducted adhering to the declaration of the institutional ethical committee. It was cross sectional descriptive hospital based study conducted in al ameen hospital vijayapura over 18 months (January 2024 to July 2025). Informed consent was obtained after detail history and examination of patients followed by ECG and 2D ECHO.

Development of mechanical complications of ventricular septal rupture, mitral regurgitation and free wall rupture and it's outcome were noted during hospital stay.

Criteria :

Inclusion criteria : patients diagnosed with acute STEMI

Exclusion criteria : pre-existing structural heart disease .

RESULTS :

INHOSPITAL COMPLICATIONS

Of the 120 patients with STEMI, 9(7.5%) developed mechanical complications in the form of ventricular septal rupture, severe MR and ventricular free wall rupture.

MORTALITY DATA

Complications	No. Of Patients	%
VSR	2	1.6
SEVERE MR	4	3.3
FWR	3	2.5

10 out of 120 patients admitted died during the hospital course resulting in a mortality rate of 8.3%.

4 out of 9 patients who developed mechanical complications died in hospital (44.4%) and the rest recovered and were discharged.

6 deaths were due to other causes.

Complications	No. Patients	No. Of Deaths	%
VSR	2	1	50
SEVERE MR	4	1	25
FWR	3	2	66.6

MORTALITY DATA

- 10 out of 120 patients admitted died during the hospital course resulting in a mortality rate of 8.3%.
- 4 out of 9 patients who developed mechanical complications died in hospital (44.4%) and the rest recovered and were discharged.
- 6 deaths were due to other causes.

CONCLUSION:

9 (7.5%) patients developed mechanical complications. 4 (40%) deaths were due to mechanical complications. The mortality rates in ACS and STEMI remain high in this hospital (8.3%).

DISCUSSION:

A total of 120 patients satisfying inclusion criteria with acute STEMI were admitted to the Medicine department at Al-Ameen medical college, Vijayapur, Karnataka.

In a total mean duration of stay at the hospital of 5+/- 2 days, 7.5% developed mechanical complications out of which 1.6 % had VSR, 3.3% developed severe ischemic MR and 2.5 % developed free wall rupture.

The mortality rate during hospital stay amounted to 8.3 % (10/120) among the 120 patients studied of which 40% (4/10) were due to mechanical complications per se which is significant.

Early hospitalization is crucial making continued medical education of primary health workers awareness of symptoms of Acute MI in public, especially in rural populations and proper availability of transport facilities are a must for its better management.

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