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Research Article

# Dedicated Heart Attack Treatment Centre Improves 2-year Survival Rate of Patients with Acute Myocardial Infarction beyond Global Average

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## Abstract

**Background:** Acute ST-Elevation Myocardial Infarction (STEMI) is one of the life-threatening coronary events with sudden cardiac death. It is the most severe clinical presentation of coronary artery disease. The acute STEMI results from an occlusive coronary thrombus at the site of a ruptured atherosclerotic plaque. The aim of the study is to assess 2-year survival rate of patients with acute STEMI received and treatment initiated at the Dedicated Heart Attack Treatment Centre.

**Materials and Methods:** A retrospective observational study was conducted at SKY Hospital & Research Centre, Imphal, India between January 2018 and January 2020 in the population of fifty patients with acute STEMI discharged from the hospital during that period.

**Results:** A rapid and intense diagnosis and treatment of patients with acute STEMI resulted in an improvement of 2-year survival with good quality of life with 92.00% survival rate.

**Conclusion:** The present study of patients with acute ST-Elevation Myocardial Infarction received and treatment started at the Dedicated Heart Attack Centre of SKY Hospital & Research Centre, Imphal, India demonstrated an increase in 2-year survival rate which is higher than many previously published survival rate.

**Keywords:** myocardial infarction; dedicated heart attack treatment centre

## Abbreviation

- Myocardial Infarction - MI
- Coronary Artery Disease - CAD
- Sudden Cardiac Death - SCD
- Dedicated Heart Attack Treatment Centre - HAC
- World Health Organization - WHO
- Cardiovascular Diseases - CVDs
- Echocardiogram - ECHO
- Percutaneous Coronary Intervention - PCI
- Drug Eluting Stent - DES
- Electrocardiogram - ECG
- ST-Elevation Myocardial Infarction - STEMI
- Emergency Room - ER
- Angiotensin-converting enzyme - ACE
- Angiotensin receptor blocker - ARB
- Dual Anti-Platelet - DAP
- Left Ventricular Ejection Fraction - LVEF

## Introduction

Coronary artery disease is one of the most common cardiovascular diseases and has been identified as the leading cause of death in both developing and developed countries [1]. Myocardial Infarction is one of the life-threatening coronary events with SCD [2] and the most severe clinical presentation of CAD [3]. Long-term survival after MI has improved over the last 3 decades in developed countries [4-11]. The broader availability of cardiac catheterization laboratories, shorter transfer time for percutaneous coronary intervention and modern drug

therapy with proven prognostic benefit in primary and secondary prevention are major achievements in the treatment of acute ST-elevation myocardial infarction (STEMI). Due to these developments the incidence of STEMI and the overall mortality due to ischemic heart disease have decreased in developed countries [12,13]. Some studies have reported improving survival after both first and recurrent Acute Myocardial Infarctions (AMIs) [14,15]. These improvements have been attributed to the effective acute treatment, increasingly widespread use of revascularization procedures and long-term secondary prevention [4,5,7,9]. Survivors of MI are at high risk of a recurrent MIs as well as other manifestations of cardiovascular disease such as stroke [16,17,18]. Although the risk of cardiovascular disease events is highest in the first year post-index MI, it remains elevated in subsequent years [19,20]. However, most studies of post-MI outcomes focus on the acute phase after the index event, with few data available for follow-up beyond the first year [21].

Dedicated Heart Attack Treatment Centre (HAC) was established at SKY Hospital and Research Centre, Imphal, India in July, 2016 providing "24 hours a day, 7 days a week" services. In the HAC, patients with suspected MI were triaged to Electrocardiogram within 5 minutes and appropriate emergency treatment initiated in the ER. Our HAC Team consists of Consultant Cardiologist/Middle Grade Cardiologist on site, other Emergency Medical Officers and well trained nurses [22]. The aim of the study is to assess 2-year survival rate of patients with acute STEMI received and treatment initiated at the HAC. The outcome includes return to his/her normal physical activity including walking one kilometer or more independently, driving 2/4 wheel private vehicles.

## Materials and Methods

The study was conducted at SKY Hospital & Research Centre, Imphal, India between January 2018 and January 2020. The study population included fifty patients with acute STEMI discharged from the hospital during that period. On arrival of patients at ER, complete history and clinical examination were carried out including 12-lead ECG, routine laboratory investigation, troponin-T, chest X-ray and Echocardiogram. The diagnosis of STEMI was made using the WHO definition and diagnostic criteria of Myocardial Infarction. ECG was given to the patient within 5 minutes of arrival. Loading dose of DAP drugs which included aspirin (300mg) along with clopidogrel (dosage 600mg for patients less than 75 years of age and 300mg for patients more than 75 years of age) were given for the patient [20]. After ruling out any contraindication (such as increase risk of bleeding), thrombolytic therapy was initiated using injection reteplase [10 units intravenous (IV) over 2 minutes (1st dose), followed by 10 units IV over 2 minutes (2nd dose) after 30 minutes], or injection tenecteplase, (30mg IV for patients weighing less than 60kg, 35mg IV for patients weighing 60kg-69 kg, 40 mg IV for patients weighing 70kg-79kg, 45mg IV for patients weighing 80kg-89kg, 50mg IV for patient weighing ≥ 90kg). Intravenous Enoxaparin bolus dose of 30mg was given along with the above medications for the patients younger than 75 years of age. Patients were then transferred to ICCU for further necessary management [22]. Eligible patients were provided with PCI with DES implantation during the same admission [22]. Patients were treated intensively and aggressively and discharged when fit. The most common prescribed medication in our hospital at the time of discharge were dual anti-platelet agents for 12 months, single anti-platelet agent to continue long term, a beta-blocker, an angiotensin-converting enzyme (ACE) inhibitor or an angiotensin receptor blocker (ARB), an aldosterone antagonist and a statin [23]. Current guidelines recommend DAPT for 12 months [24-27], following European Society of Cardiology guidelines noting that the duration may be extended up to 30 months in selected patients, if required [27].

Assessment of patients for those who have survived during out-patient follow up includes LVEF when available or possible. The well being of the patients were also assessed over the phone or through messengers living in the locality of index patient in February, 2025. Our parameters of assessment of wellbeing at the end of two years after the index event were walking 1 km or more without symptoms, resuming normal activities, cycling or driving 2/4 wheel-vehicles.

Out of 52 patients treated during the study period, 2 patients were lost to follow up and hence those patients were excluded from the study. 50 patients (male and female) with acute STEMI admitted and treatment started at the dedicated HAC of our hospital between January 2018 and January 2020 were included in the study. Of the 50 patients, 16 of them had Echocardiographic assessment of their LVEF which showed significant improvement (Table 1). 78 percent have reported resuming their normal activities including walking 1 km or more on level without symptoms and cycling or driving 2/4 wheel-vehicles.

## Results

Of the 50 patients, 42 (84.00%) were males and 8 (16.00%) were females. The age groups range from 31 years to 85 years. The result applies across all age groups. Of these, 88.00% of patients underwent PCI with DES implantation during the admission.

The 2-year survival rate of patients with acute STEMI discharged after observing discharge protocol is depicted in Figure 1.

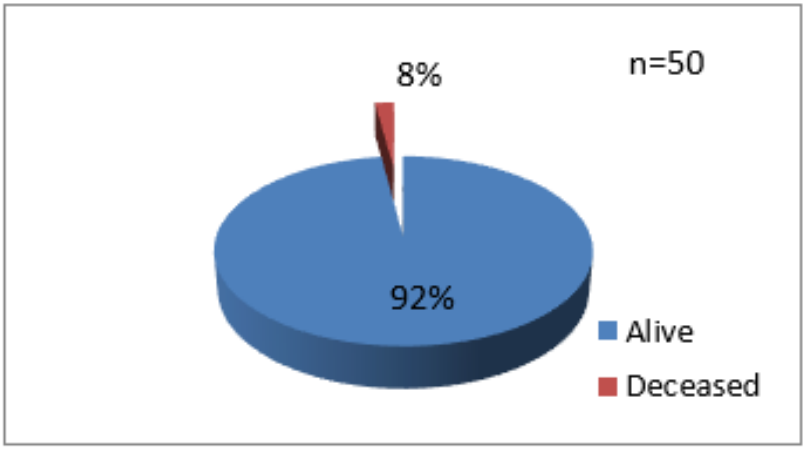


**Figure 1:** 2-year survival rate of patients with acute STEMI.

The findings indicate that the majority of patients (92.00%) with acute STEMI treated between January 2018 and January 2020 survived at two years of discharge from the hospital with comfortable and useful life. Four patients (8.00%) died during the follow up, due to all cause mortality.

Majority of patients with Acute STEMI achieved satisfactory physical activities namely, walking 1 km on level or cycling without symptoms or driving 2/4 wheel-vehicles was considered achieving satisfactory level of physical activity.

Of the 50, two patients required one PCI with one DES each to two denovo lesions.

Mean, mean difference and "t-test" value of LVEF at discharge and at follow up (2-year) after discharge from the hospital is shown in Table 1.

| LVEF (%) | Mean | Mean Difference | Median | 't-test' |
|---|---|---|---|---|
| At discharge | 44.8 | 11.4 | 48 | 5.8 |
| At follow up (2 years) after discharge | 56.2 | | 54 | |

**Table 1:** The LVEF at discharge and at follow up (2 years) after discharge.

The data presented in Table 1 indicated that the mean of LVEF at follow up (56.2) has shown improvement in comparison to the mean of LVEF at the time of discharge (44.8). The mean difference of 11.4 was statistically significant as evident from 't-test' value of 5.8. The result is significant at p value < 0.001 level.

## Discussion

The objective of this study is the survival of patients with acute STEMI admitted and treatment started at the dedicated HAC of our hospital between January 2018 and January 2020. This study shows that the 2-year survival rate of patients was 92.00%. In a similar study, the survival of patients with STEMI after discharge observed at 3 months, 1 year, and 2 years were 93.90%, 88.50%, and 83.60% respectively [28]. Mosa Farkhani et al. reported that the 1 year survival rate was 80.00%, and the survival was estimated to be 64.00% in the total follow up period of five years [29]. The study by Nadlacki et al. in Australia has shown that 1 year survival rate was 85.90%, 3 years survival rate of 68.60%, and the total survival rate at 7 years was calculated at 62.30% [30]. Another study [31] showed that the overall 28 days, 6 months and 1 year survival rates after the MI in 22187 patients were 95.00%, 90.00% and 88.00% respectively. In another study by Bayat S et al., the survival rate of patients at 1 year was (88.00%), 3 years (81.00%), 5 years (78.00%) and 7 years (74.00%) [32]. In Saga Johansson et. al. study, most of the survival benefit seemed to occur during the first year of acute MI [21]. In the study of Diaz, survival rate in one year was 85% [33]. Nevertheless, the present study has shown favourable survival rate at 92.00% after 2 years of discharge.

## Limitation

The study result should be interpreted keeping in mind the sample size. Larger size study may further authenticate the outcome of the study.

## Conclusion

Most of the studies of post myocardial infarction outcomes focus on the acute phase after the index event, with few data available for follow-up beyond the first year. The present study of patients with acute ST-Elevation Myocardial Infarction received and treatment started at Dedicated Heart Attack Centre of SKY Hospital & Research Centre demonstrated an increase in 2-year survival rate which is higher than many previously published survival rate. This may indicate that the initiation of quick and intense diagnosis and treatment of patients with acute STEMI at the Dedicated Heart Attack Centre results in improvement of survival with good quality of life at later years.

## References


1. Qi XT, Wang H, Zhu DG, Zheng L, Cheng X, Zhang RJ, Dong HL (2024). Global trends in coronary artery disease and artificial intelligence relevant studies: a bibliometric analysis. Eur Rev Med Pharmacol Sci.; 28(1):1-22.
2. MS Hahla, Y Saeed, H Razieh (2016). Comparison of risk factors & clinical and angiographic characterization of STEMI in young adults with older patients. Res J Pharm Biol Chem Sci.;7(6):2013-6.
3. Yeh RW, et al (2010). Population trends in the incidence and outcomes of acute myocardial infarction. N Engl J Med.;362(23):2155–2165.
4. Capewell S, Livingston BM, MacIntyre K, Chalmers JWT, Boyd J, Finlayson A, Redpath A, Pell JP, Evans CJ, McMurray JJV (2000). Trends in case-fatality in 117 718 patients admitted with acute myocardial infarction in Scotland. Eur Heart J.;21:1833–1840.
5. Hardoon SL, Whincup PH, Petersen I, Capewell S, Morris RW (2010). Trends in longer-term survival following an acute myocardial infarction and prescribing of evidenced-based medications in primary care in the UK from 1991: a longitudinal population-based study. J Epidemiol Community Health;65:770–774.
6. Stewart A, Beaglehole R, Jackson R, Bingley W (1999). Trends in three-year survival following acute myocardial infarction, 1983–1992. Eur Heart J.; 20:803–807.
7. Bata IR, Gregor RD, Wolf HK, Brownell B (2006). Trends in five-year survival of patients discharged after acute myocardial infarction. Can J Cardiol.;22:399–404.
8. Rasmussen S, Abildstrom S, Rosén M, Madsen M (2004). Case-fatality rates for myocardial infarction declined in Denmark and Sweden during 1987–1999. J Clin Epidemiol.;57:638–646.
9. Briffa T, Hickling S, Knuiman M, Hobbs M, Hung J, Sanfilippo F, Jamrozik K, Thompson P (2009). Long term survival after evidence based treatment of acute myocardial infarction and revascularisation: follow-up of population based Perth MONICA cohort, 1984–2005. BMJ.; 338.
10. Langørgen J, Igland J, Vollset S, Averina M, Nordrehaug J, Tell G, Irgens L, Nygård O (2009). Short-term and long-term case fatality in 11 878 patients hospitalized with a first acute myocardial infarction, 1979–2001: the Western Norway cardiovascular registry. Eur J Cardiovasc Prev Rehabil.;16:621–627.
11. Botkin N, Spencer F, Goldberg R, Lessard D, Yarzebski J, Gore J (2006). Changing trends in the long-term prognosis of patients with acute myocardial infarction: a population-based perspective. Am Heart J.;151:199–205.
12. Ibanez B, James S, Agewall S, Antunes MJ, Bucciarelli-Ducci C, Bueno H, et al. (2018). 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation: The Task Force for the management of acute myocardial infarction in patients

presenting with ST-segment elevation of the European Society of Cardiology (ESC). Eur Heart J. 39:119–1177.
13. Virani SS, Alonso A, Benjamin EJ, Bittencourt MS, Callaway CW, Carson AP, et al. (2020). Heart disease and stroke statistics-2020 update: a report from the american heart association. Circulation. 141:e139–596.
14. Shotan A, Gottlieb S, Goldbourt U, Boyko V, Reicher-Reiss H, Arad M, Mandelzweig L, Hod H, Kaplinsky E, Behar S (2001). Prognosis of patients with a recurrent acute myocardial infarction before and in the reperfusion era-A national study. Am Heart J.;141:478–484.
15. Buch P, Rasmussen S, Gislason G, Rasmussen J, Køber L, Gadsbøll N, Stender S, Madsen M, Torp-Pedersen C, Abildstrom S (2007). Temporal decline in the prognostic impact of a recurrent acute myocardial infarction 1985 to 2002. Heart.;93:210–215.
16. Smolina K, Wright FL, Rayner M, Goldacre MJ (2012). Long-term survival and recurrence after acute myocardial infarction in England, 2004 to 2010. Circ Cardiovasc Qual Outcomes.;5(4):532–40.
17. Witt BJ, Brown Jr RD, Jacobsen SJ, Weston SA, Yawn BP, Roger VL (2005). A community-based study of stroke incidence after myocardial infarction. Ann Intern Med.;143(11):785–792.
18. Campo G, Saia F, Guastaroba P, Marchesini J, Varani E, Manari A, Ottani F, Tondi S, De Palma R, Marzocchi A (2011). Prognostic impact of hospital readmissions after primary percutaneous coronary intervention. Arch Intern Med.;171(21):1948–1949.
19. Jernberg T, Hasvold P, Henriksson M, Hjelm H, Thuresson M, Janzon M (2015). Cardiovascular risk in post-myocardial infarction patients: nationwide real world data demonstrate the importance of a long-term perspective. Eur Heart J.;36(19):1163–1170.
20. Rapsomaniki E, Thuresson M, Yang E, Blin P, Hunt P, Chung SC, Stogiannis D, Pujades-Rodriguez M, Timmis A, Denaxas SC, et al (2016). Using big data from health records from four countries to evaluate chronic disease outcomes: a study in 114 364 survivors of myocardial infarction. Eur Heart J Qual Care Clin Outcomes.;2(3):172–183.
21. Johansson S, Rosengren A, Young K, Jennings E (2017). Mortality and morbidity trends after the first year in survivors of acute myocardial infarction: a systematic review. BMC Cardiovasc Disord.;17(1):53.
22. Lairikyengbam SKS, Yadave R, A S Devic et. al. (2020) Dedicated Heart Attack Treatment Centre reduces Door to Needle Time in Acute Myocardial Infarction- A single centre study in North Eastern India. J. Cardiol Clin Res; 8(2):1155.
23. Lairikyengbam SKS, Yadave Ramdeo, Athokpam Swarnamayee, (2024). Dedicated Heart Attack Treatment Centre increases 1-year survival rate of patients with Acute Myocardial Infarction-A single centre study in North Eastern India, J. Clinical Cardiology and Cardiovascular Interventions, 7(2).
24. Amsterdam EA, Wenger NK, Brindis RG, Casey Jr DE, Ganiats TG, Holmes Jr DR, Jaffe AS, H Jneid, Kelly RF, Kontos MC, et al (2014). 2014 AHA/ACC guideline for the management of patients with non-ST-elevation acute coronary syndromes: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol.;64(24):e139–228.
25. Roffi M, Patrono C, Collet JP, Mueller C, Valgimigli M, Andreotti F, JJ Bax, Borger MA, Brotons C, Chew DP, et al (2016). 2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation: Task Force for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation of the European Society of Cardiology (ESC). Eur Heart J.;37:267–315.
26. Steg PG, James SK, Atar D, Badano LP, Blomstrom-Lundqvist C, Borger MA, Di Mario C, Dickstein K, Ducrocq G, Fernandez-Aviles F, et al (2012). ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. Eur Heart J.;33(20):2569–2619.
27. Windecker S, Kolh P, Alfonso F, Collet JP, Cremer J, Falk V, Filippatos G, Hamm C, Head SJ, Juni P, et al (2014). 2014 ESC/EACTS guidelines on myocardial revascularization: the Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS) developed with the special contribution of the European Association of Percutaneous Cardiovascular Interventions (EAPCI). Eur Heart J.;35(37):2541–619.
28. Darling CE, Fisher KA, McManus DD, Coles AH, Spencer FA, Gore JM, Goldberg RJ (2013). Survival after hospital discharge for ST-segment elevation and non-ST-segment elevation acute myocardial infarction: a population-based study. Clin Epidemiol.;5:229-236.
29. Mosa Farkhani E, Baneshi MR, Zolala F (2014). Survival rate and its related factors in patients with acute myocardial infarction. Med J Mashhad Univ Med Sci.;57(4):636-646
30. Nadlacki B, Horton D, Hossain S, Hariharaputhiran S, Ngo L, Ali A, et al (2021). Long term survival after acute myocardial infarction in Australia and New Zealand, 2009-2015: a population cohort study. Med J Aust.;214(11):519-525.
31. Mozaffarian S, Etemad K, Aghaali M et al (2021). Short And Long-Term Survival Rates Following Myocardial Infarction And Its Predictive Factors: A Study Using national registry data. J The Univ Heart Cr.; 16(2):68-74.
32. Bayat S, Hashemi Nazari SS, Mehrabi Y et al (2002). Long-term survival rate following myocardial infarction and the effect of discharge medications on the survival rate. J Res Health Sci.;22(4):102.
33. Diaz Manuel Chacón, Vásquez Akram Hernández, Sánchez (2022). One-year survival among patients with ST-elevation myocardial infarction in Peru. Arch Peru Cardiol Cir Cardiovasc.;3(2):53-59.

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