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Research Article

Dedicated Heart Attack Treatment Centre increases 1-year survival rate of patients with Acute Myocardial Infarction-A single centre study in North Eastern India

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Abstract

Background: Comparing with the general population, myocardial infarction survivors have a higher risk of mortality in the first year after discharge from the hospital. The aim of the study is to assess 1-year survival rate of patients with acute ST elevation myocardial infarction (STEMI) treated at the Dedicated Heart Attack Centre of SKY Hospital and Research Centre, Imphal, India.

Material and Method: A retrospective observational study of 56 patients with acute STEMI treated at the Dedicated Heart Attack Centre of our hospital between January 2018 and February 2020 were included in the study. The data of these patients with acute STEMI on 1-year survival rate, Left ventricular ejection fraction (LVEF) at discharge and at follow up (6 months to 1 year) and physical activity was evaluated from patient record and phone calls.

Result: The result demonstrates that establishing a Dedicated Heart Attack Centre, Imphal, India in line with London Heart Attack Centre, has helped increase 1-year survival rate of patients with acute STEMI after discharge from the hospital.

Conclusion: The study provides evidence of increase in 1-year survival rate of patients with acute STEMI treated at the Dedicated Heart Attack Centre after discharge from the hospital.

Keywords: myocardial infarction; dedicated heart attack treatment centre

Introduction

Myocardial Infarction (MI) is one of the life threatening coronary-associated pathologies characterized by sudden cardiac death [1]. MI is the main cause of human death, globally [2]. Long-term survival after MI has improved over the last 3 decades in developed countries [3-10]. However, approximately 20% of patients experiencing an acute MI die within 1 year of the index event, with over half the first-year mortality occurring within 30 days of MI [4]. According to the World Health Organization (WHO) approximately 23.6 million people will die by 2030 due to cardiovascular diseases (CVDs) [11]. Survival is an important outcome of acute MI. The follow-up period is short in most survival studies [12]. As the WHO MONICA project results suggest, MI attacks during the first 28 days are not considered separate; and if a person dies from one of these potential attacks in the first 28 days, his/her death should be considered due to the first attack [13].

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" (24x7) services. In the HAC, patients with suspected MI were triaged to Electrocardiogram (ECG) < 5 minutes and further appropriate emergency treatment initiated in the Emergency Room (ER). Our HAC Team consists of Consultant Cardiologist/Middle Grade Cardiologist on site, other Emergency Medical Officers and well trained nurses [14]. The aim of the study is to assess 1-year survival rate of patients with acute STEMI after discharge from the hospital. The LVEF at discharge and at follow up (6 months to 1 year) after discharge and the physical well being of the patients are also assessed.

Material and Method

The study was conducted at SKY Hospital & Research Centre, Imphal, India. Fiftysix patients with acute STEMI discharged from the hospital between January 2018 and February 2020 were included in the study. During hospital admission, complete history and clinical examination were carried out

including 12-lead ECG, routine laboratory investigation, troponin-T, chest X-ray (CXR). The diagnosis of STEMI was made using the WHO definition and diagnostic criteria of Myocardial Infarction. ECG was given to the patients within 5 minutes of presentation to the ER. Loading dose of dual anti-platelet (DAP) drugs which included aspirin (300 mg) along with clopidogrel (dosage 600 mg for patients less than 75 years of age and 300 mg for patients more than 75 years of age), were given for the patient [14]. After ruling out any contraindication (such as increase risk of bleeding), thrombolytic therapy was initiated using injection reteplase [10 units intravascular (IV) over 2 minutes (1st dose), followed by 10 units IV over 2 minutes (2nd dose) after 30 minutes], or injection tenecteplase, (30 mg IV for patients weighing less than 60 kg, 35 mg IV for patients weighing 60 kg - 69 kg, 40 mg IV for patients weighing 70 kg - 79 kg, 45 mg IV for patients weighing 80 kg - 89 kg, 50 mg IV for patient weighing ≥ 90 kg). Patients were then transferred to ICCU for further necessary management [14]. Further, eligible patients were given coronary angiography and percutaneous coronary intervention (CAG+PCI) with Drug Eluting Stent (DES) implantation during their admission. 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 an angiotensin receptor blocker (ARB), an aldosterone antagonist and a statin.

Current guidelines recommend DAPT for 12 months [15-18], following European Society of Cardiology guidelines noting that the duration may be extended up to 30 months in selected patients, if required [18].

The data of these patients with acute STEMI on 1-year survival rate, LVEF at discharge and at follow up (6 months to 1 year) and physical activity was evaluated from patient record and phone calls. Of the 72 patients treated between January 2018 and February 2020, 16 patients that were lost to follow-up were excluded from the study. One year survival rate of 56 patients with acute STEMI were included in the study. The LVEF at discharge and at follow up (6 months to 1 year) after discharge from the hospital were collected and collated. Physical well-being of the patients was assessed by his/her ability to walk 1 km on level without symptom as per the protocol approved by the committee.

Result

Of the 56 patients, 47 (84%) were males and 9 (16%) were females. The age groups range from 29 years to 83 years. The result applies across all age groups. Of these 89.3% of patients underwent CAG+PCI with DES implantation during the admission.

The 1-year survival rate of patients with acute STEMI discharged from hospital is depicted in Figure 1.
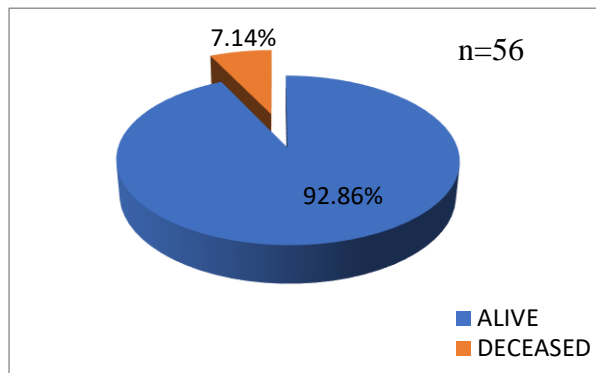

Figure 1: 1 year survival rate of patients with acute STEMI

The findings indicate that the majority of patients (92.86%) with acute STEMI admitted during the 2-year period survived at one year of discharge from the hospital with comfortable and useful life. Four patients (7.14%) died during the follow up, due to all cause mortality.

Mean, mean difference and 't-test' value of LVEF at discharge and at follow up (6 month to 1 year) after discharge from the hospital is shown in Table 1.

LVEF	Mean	M_D	't-test'
At discharge	42.5	9.3	5.1
At follow up (6 months to 1 year) after discharge	51.8		

Table 1: The LVEF at discharge and at follow up (6 months to 1 year) after discharge

The data presented in Table 1 indicated that the mean of LVEF at follow up (6 months to 1 year) after discharge (51.8) was higher than the mean of LVEF at the time of discharge (42.5). The mean difference of 9.3 was statistically significant as evident from 't-test' value of 5.1. The result is significant at p value < 0.01 level.

Majority of patients with acute STEMI resumed physical activity including walking more than 1 km on level without symptom was considered achieving satisfactory level of physical activity. Some of them resumed office duty with one of them able to join sporting event.

Discussion

Survival with normal or near normal activities for age is the main targeted outcome after MI. In this study, 1-year survival rate of patients with acute STEMI admitted during the 2-year period was 92.86%. In a similar study by Bayat S et al., the survival rate of patients, over the period of 1-year was (88%), 3-year (81%), 5-year (78%) and 7-year (74%). At least 5-10% of survivors die in the first 12 months of MI [12]. In the study by Mosa Farkhani et al., the 1-year survival rate was 80%, and survival was estimated to be 64% in the total period of five years [19]. In a study by Nadlacki et al. in Australia, 1-year survival rate was 85.9%, 3-year survival was 68.6%, and the total rate of the 7-year survival period was calculated at 62.3% [20].

Another study showed that the overall 28-day, 6-month and 1-year survival rates after MI in 22187 patients were 95%, 90% and 88% respectively [21]. The survival rate in the current study was higher at 92.86% than some of the previously published survival rate.

The incidence of MI in male in comparison to female was 84% versus 16% showing the much higher trend of MI in male in this study. In another single study that compared survival after the first year with that of the general population, there was a lack of improvement between the time periods 1997-2001 and 2001-2006; most of the decease would therefore seem to occur during the first year [22].

The study results should be interpreted keeping in mind the sample size, larger size study may further authenticate the result of the study.

Conclusion

Reports of the survival rate of patients with acute ST Elevation Myocardial Infarction in developing countries, particularly by province or state, are rare. This study demonstrated that establishing a Dedicated Heart Attack Centre, Imphal, India in line with London Heart Attack Centre, has helped increase 1-year survival rate of patients with acute STEMI after discharge from the hospital.

Abbreviation

- **MI-**Myocardial Infarction
- **HAC-**Dedicated Heart Attack Treatment Centre
- **WHO-**World Health Organization
- **CVDs-**Cardiovascular Diseases
- **ECHO-**Echocardiogram
- **CAG+PCI-**Coronary Angiography and Percutaneous Coronary Intervention
- **DES-**Drug Eluting Stent
- **ECG-**Electrocardiogram
- **STEMI-**ST elevation myocardial infarction
- **ER-**Emergency Room
- **CXR-**Chest X-ray
- **ACE-**Angiotensin-converting enzyme
- **ARB-**Angiotensin receptor blocker
- **DAP-**Dual anti-platelet
- **LVEF-**Left ventricular ejection fraction

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