

Research Article

Dedicated Heart Attack Treatment Centre reduces Door to Needle Time in Acute Myocardial Infarction-A single centre study in North Eastern India

Lairikyengbam SKS^{1*}, Ramdeo Yadaveb², Athokpam Swarnamayee Devic³, and Sanjeeta Devid N⁴

¹Chief Cardiologist, SKY Hospital & Research Center, India

²Senior Consultant, Interventional Cardiologist and Electrophysiologist, Batra Hospital and Medical Research Centre, Delhi; visiting Consultant at SKY Hospital & Research Center, India

³Academic Executive, SKY Hospital & Research Center, India

⁴Research Executive, SKY Hospital & Research Center, India

***Corresponding author**

Lairikyengbam SKS, Chief Cardiologist, SKY Hospital & Research Center, Imphal, India, Email address: slairik@hotmail.com

Submitted: 14 August 2020

Accepted: 26 August 2020

Published: 28 August 2020

Copyright

© 2020 Lairikyengbam SKS, et al.

OPEN ACCESS**Keywords**

- Myocardial infarction
- Thrombolysis

Abstract

Acute Coronary Syndrome (ACS), Registry in northern India showed an additional one hour delay of Door to Needle Time (DNT), in the initiation of thrombolytic therapy for acute ST-Elevation Myocardial Infarction (STEMI) increases the hazard ratio of death by 20%. A retrospective observational study of 75 patients with acute STEMI treated at the Dedicated Heart Attack Centre (HAC) of SKY Hospital and Research Center, Imphal, India between January 2018 and February 2020 showed a reduction of DNT and an improvement of 30 minutes thrombolysis time to 76% from 35.6% where such dedicated HAC is unavailable.

INTRODUCTION

Coronary artery disease (CAD), is a major cause of morbidity and mortality in India. Approximately, 8-10% of Indians in urban areas and 3-4% in rural areas have CAD [1-4]. Dedicated HAC was established at SKY Hospital and Research Center, Imphal, India in July, 2016 providing 24x7 services, early electrocardiogram (ECG), dual anti-platelet (DAP) therapy, timely administration of thrombolytic therapy for acute STEMI, and early patients transfer to ICCU. Bedside Echocardiogram is performed within 30 minutes of admission in ICCU. Our HAC Team consists of Consultant Cardiologist/middle grade Cardiologist on site, other Emergency Medical Officers and well trained nurses.

International guidelines are clear in specifying that patients with acute STEMI should receive urgent coronary reperfusion with either primary percutaneous coronary intervention (PCI) or thrombolysis [5]. The PCI is available to less than 10% of

STEMI patients in India (CREATE registry) [6]. Consequently, local recommendations on STEMI management exist to promote timely administration of thrombolysis within 30 minutes of patient arrival [7]. Reduction of DNT for acute STEMI was the outcome of this study.

MATERIAL & METHOD

The study was conducted at SKY Hospital & Research Center, Imphal, India. Seventy five patients of acute STEMI from January 2018 to February 2020 were included in the study, including 62 (83%), males and 13 (17%), females. The time between arrivals at the hospital to the time of administration of thrombolytic therapy was obtained along with details of further treatment in the hospital. Relevant time intervals, such as DNT within 30 minutes, DNT beyond 30 minutes, the median DNT were calculated. The data of patients who underwent coronary angiogram (CAG) and PCI were collected and collated.

Complete history and clinical examinations were carried out, including 12-lead ECG, routine laboratory investigations, troponin-T test, chest x-ray (CXR). The diagnosis of STEMI was made using the World Health Organization (WHO) definition and diagnostic criteria of Myocardial Infarction (MI) [8].

ECG was given to the patient within 5 minutes of presentation in the Emergency Room (ER), and thorough management was provided. Loading dose of dual anti-platelet (DAP), drug which included tablet aspirin (300mg) along with tablet clopidogrel (dosage 600mg for patients less than 75 years of age and 300mg for patients more than 75 years of age), were initiated for the patient. After ruling out any contraindication (such as increase risk of bleeding), thrombolytic therapy was given using injection reteplase [10 units intravascular (IV) over 2 minutes (1st dose), followed by 10units IV over 2minutes (2nd dose), after 30minutes], or injection tenecteplase (dosage 30mg IV for patients weighing less than 60kg, 35mg IV for patients weighing 60kg-69kg, 40mg IV for patients weighing 70kg-79kg, 45mg IV for patients weighing 80kg-89kg, 50mg IV for patients weighing ≥ 90 kg). Patients were then transferred to ICCU for further necessary ICCU management.

RESULTS

Out of the 75 patients, 51 patients received thrombolytic therapy within the hospital. Of these 42 (82%), were males and 9 (18%), were females.

The finding of DNT within 30 minutes and DNT beyond 30 minutes is depicted in Figure 1.

The findings indicated that the majority thirty nine patients (76%), were thrombolysed within 30 minutes, twelve patients (24%), were thrombolysed beyond 30 minutes due to late presentation of the patient from the time of onset of pain.

Overall seventy five percent underwent CAG+PCI with Drug Eluting Stent (DES), implantation. The median length of hospital stay of those patients who survived was 10 days (1- 38 days). Ninety six percent of all patients with acute STEMI admitted during the 2 year period survived at the time of discharge.

Mean, median and standard deviation for various time parameters was calculated and is shown in Table 1.

DISCUSSION

Of 75 patients with acute STEMI, 51 patients received thrombolytic therapy in the hospital. Seventy six percent of them (39 patients), received thrombolysis within 30 minutes as per the guideline of the American Heart Association (AHA) [9]. In a similar study by Dean Vlahaki et al., the median door-to-ECG time was 6 minutes, door-to-physician time was 8 minutes and DNT was 27 minutes; 58% of patients received thrombolytic therapy within 30 minute.10

The remaining 12 patients (24%), were thrombolysed beyond 30 minutes. This might be the result of late presentation or party delaying in decision making. Another study showed that patients received thrombolytic therapy within 30 min at 25.8% of the time without Emergency Medicine (EM), faculty presence compared to 65.4% with EM faculty presence. 11 Another study showed that the median door to needle time was 95 minutes.12 Yet in another study, Ali Omraninava et al., indicated that the mean DNT was 66.39 ± 29.17 (range of 20 - 185 minutes) [13].

CONCLUSION

This study demonstrated that establishing a dedicated Heart Attack Centre, in line with London Heart Attack Centre has helped reduce Door to Needle Time and improve Target DNT of 30 minutes in 76% of thrombolytic therapy for acute ST-Elevation myocardial infarction.

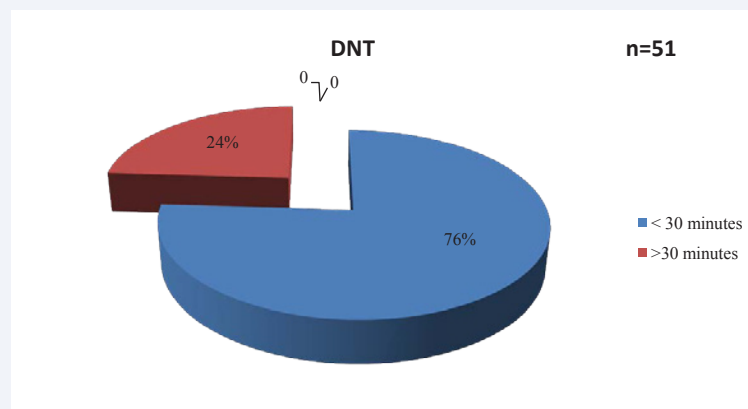


Figure 1 Door-to-needle time.

Table 1: Various time parameters in minutes.

Time parameters (Minutes)	Mean	Median	Std. Deviation
Door-to-ECG	5	5	0
Door to dual anti-platelet	14	10	14
Door-to-needle	25	20	26

REFERENCES

1. Rawles JM. Quantification of the benefit of earlier thrombolytic therapy: Five year results of the Grampian Region Early Anistreptase Trial (GREAT). *J Am Coll Cardiol*. 1997; 119-177.
2. Negi PC, Merwaha R, Panday D, Chauhan V, Guleri R. Multicenter HP ACS registry. *Indian Heart J*. 2016; 68: 118-127.
3. Kumar S, Gurpreet SW, Singh B, Kansal M, Mohan B, Aslam M, et.al. Evaluation of intracoronary blood from obstructive vessel in patients of ST-elevation myocardial infarction undergoing PPCI. *Indian Heart J*. 2019; 71.
4. Srinath Reddy K, Shah B, Varghese C, Ramadoss A. Responding to the threat of chronic diseases in India. *Lancet*. 2005; 366: 1744-1749.
5. Mark Jordan, Jenny Caesar. Improving door-to-needle times for patients presenting with ST-elevation myocardial infarction at a rural district general hospital. *J Am College of Cardiol*. 2020; 5: 1.
6. Xavier D, Pais P, Devereaux PJ, Xie C. Treatment and outcomes of acute coronary syndromes in India (CREATE): a prospective analysis of registry data. *Lancet*. 2008; 371: 1435-1442.
7. Anderson JL, Karagounis LA, Califf RM. Meta-analysis of five reported studies on the relation of early coronary patency grades with mortality and outcomes after acute myocardial infarction. *Am J Cardiol*. 1996; 78: 1.
8. Shanthi Mendis, Kristian Thygesen, Kari Kuulasmaa, Simona Giampaoli. World Health Organization definition of myocardial infarction. 2010.
9. Hani Jneid, Daniel Addison, Deepak L. Bhatt, Gregg C. Fonarow, Sana Gokak, et al. 2017 AHA/ACC Clinical Performance and Quality Measures for adults with ST-Elevation and Non-ST-Elevation Myocardial Infarction. A report of the American College of Cardiology/ American Heart Association Task Force on Performance Measures. *J Am Coll Cardiol*. 2017; 70: 2048-2090.
10. Dean Vlahaki, Fianni M, Milne WK. A door-to-needle time of 30 minutes or less for myocardial infarction thrombolysis is possible in rural emergency departments. Cambridge University Press. 2008; 10: 429-433.
11. Weaver CS. Impact of emergency medicine faculty on door to thrombolytic time. *J Emerg Med*. 2004; 26: 279-283.
12. Abba AA, Wani BA, Rahmatullah RA, Khalil MZ, Kumo AM, Ghonaim MA. Door to needle time in administering thrombolytic therapy for acute myocardial infarction. *Saudi Med J*. 2003; 24: 361-364.
13. Omraninava Ali, Masoud Hashemian, Masoumi B. Effective Factors in Door-to-Needle Time for Streptokinase Administration in Patients With Acute Myocardial Infarction Admitted to the Emergency Department. *Trauma Mon*. 2016; 21: e19676.

Cite this article

Lairikyengbam SKS, Yadaveb R, Devic AS, Sanjeeta DN (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.