

Cardiogenic shock in Non-ST elevated AMI patients in a rural tertiary care hospital in Eastern India

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Abstract

Introduction: Acute Myocardial infarction is one of the leading causes of morbidity and mortality worldwide. Cardiogenic Shock is the leading cause of death in patients hospitalised for acute MI. Although there is substantial evidence for a benefit of reperfusion therapy for ST elevation MI, the best treatment strategy for patients with non-ST segment elevated MI is less well defined. Outcome and prognosis differs with the presence or absence of ST segment elevation. Most of the studies have been done on urban population. **Objective:** To determine the frequency and profile of Non-ST elevated MI. Any differences in profile in a Rural population with different social and economic structure will also be documented. **Methods:** In this descriptive cross-sectional study conducted in Medicine department, Malda Medical College & Hospital, West Bengal, India 100 patients of non STEMI are selected by using consecutive non probability sampling technique. After taking ethical clearance from Institution and consent from patients and their relatives, 100 patients of non STEMI are enrolled as per inclusion and exclusion criteria. They are evaluated for cardiogenic shock on the basis standard clinical examination and are managed as per protocol. All relevant data are recorded in predesigned proforma. **Results:** Out of 100 patients, 68 are male and 32 are female. Mean age of the patients is 60 + 1.26 years and majority of them are in the age group of 61-70 years (41%). 5% patients of non STEMI developed cardiogenic shock and majorities are male and more than 50% of patients with cardiogenic shock with non STEMI are above 70 years old. **Conclusion:** Frequency and Profile is comparable to other studies. This rising trend in a rural population of a developing country is due to probably more urbanisation related to change in food habits and life style changes.

Key words: Cardiogenic shock (CS), non-ST elevated AMI, ST-elevated AMI, Myocardial infarction

Introduction

Coronary artery disease is one of the leading causes of death in globally. Risk of developing coronary artery disease is gradually rising in developing countries apart from developed countries. This is attributed to changes in food habits, life style changes and decreased physical activities. Smoking and alcohol has added additional risk to the problem. Most importantly it is noted that incidence of coronary artery disease in south east Asian is more among younger population (52.5 + 10.8 years) than western countries [1]. Though

robust studies are available on ST elevated MI and mostly in urban population, there are little study to obtain the comprehensive data on characterisation of non ST elevated Myocardial infarction and that too in a rural population. However depending on available researches, the fraction of patients having non-ST elevation AMI is around 16.5% of the patients of ACS [2]. Cardiogenic shock, a deadly complication of AMI, is characterised by poor end organ perfusion due to malfunction of cardiac contractility [3]. It is commonly seen in ST segment elevated AMI. But it is found that cardiogenic shock can occur in high risk patients having non ST elevated AMI in about 2.5% of cases. Cardiogenic

Manuscript received: 30th November 2017
Reviewed: 9th December 2017
Author Corrected: 18th December 2017
Accepted for Publication: 22nd December 2017

shock needs early identification, timely aggressive treatment with invasive strategy using coronary angiogram and angioplasty [4]. Compared with ST elevated AMI, patients of non ST elevated AMI are older and have more cardiac risk factors or comorbidities like diabetes, hypertension, dyslipidaemia. Cardiogenic shock in non-ST elevated AMI is less identified early and treated less aggressively due to misconception with Non-transmural MI, risk of death is more compared to ST elevated AMI[5].

Objective: 1. To determine the frequency of cardiogenic shock in patients of non ST elevated AMI in a rural population. 2. To compare any differences in a rural population with different social and economic structure.

Methods

- a) Study Type:** Descriptive cross-sectional study.
b) Sample size: Total of 100 patients of non ST elevated AMI were enrolled.
c) Sampling technique: Consecutive non probability sampling technique used.

Results

Out of 100 patients of non ST elevated AMI 68 were male and 32 were female. Regarding age distribution of 100 study patients, 4 patients were in 41-50 years age group, 22 patients from 51-60 years age group, 39 patients from 61-70 years age group and 35 patients were from 71 years and above age group. Mean age of study patients was 60 + 1.26 years. Overall 5 patients with non ST elevated AMI developed cardiogenic shock whereas 95 patients did not have cardiogenic shock. Among 5 patients of cardiogenic shock with non ST elevated AMI 3 were male and 2 were female and half of them were above 70 years old. 3 patients out of 5 patients with cardiogenic shock are in the age group of above 70 years, 1 patient with cardiogenic shock lies in the age group of 61-70 years and 1 patient with cardiogenic shock lies in the age group of 51-60 years.

Table-1 showed that there was no significant difference in association of gender and age group distribution with cardiogenic shock in patients with non ST elevated AMI.

Table-1: Association of Gender, age distribution of AMI WITH Cardiogenic Shock in patients with Non ST Elevated AMI.

Characteristics		Cardiogenic Shock			Total (n=100)	P value (Chi Square test)
		Yes	No			
		Frequency (n=5)	Frequency (n=95)	Percent-age		
Gender distribution	Male	3	65	68.4 %	68	0.27
	Female	2	30	31.6 %	32	
Age distribution (years)	40-50	0	4	4.2%	4	0.21
	51-60	1	21	22 %	22	
	61-70	1	38	40 %	39	
	>70 years	3	32	33.8%	35	

Discussion

Coronary artery disease is very common in developed countries, affecting the majority of adult person over the age of 60 years but this problem is rising in rural populations of developing countries, affecting agegroup comparable to that of developed countries. Left ventricular dysfunction (LVD) is the most frequent cause of cardiogenic shock [13]. In a recent trial, it was highlighted that LVD was the main etiology[14] occurring in 74.5% of patients. This was followed by acute mitral regurgitation (8.3%), ventricular septal rupture (4.6%), isolated right ventricular shock (3.4%), tamponade or cardiac rupture (1.7%), and other causes (8%).

Mean age of this study is 60 + 1.26 years as compared to 62 + 5 years in COURAGE trial conducted in USA [5]. In this study most of the The relative importance of coronary artery disease varies across regions and from country to country. The patients are in the age group 61-70 years (39%) followed by above 70 years (35%). 68% of patients in this study are male and 32% of patients are female and these findings are similar to study conducted by Saleheen D et al[6]. From this study it is found that cardiogenic shock is present in 5% of patients of non ST elevated AMI and almost all of them are above 50 years of age.

Similar results are found in a study done by Rosamond W et al [7] in which cardiogenic shock is present in non ST elevated AMI in about 6% and most of them are above 50 years old. In another study by R Bhardwaj in 2014, incidence of NSTEMI in young adults (<40 years of age) was found to be 5.84% [15]. However, Holmes DR jr, et al [8] and Jacobs AK, et al [9] reported cardiogenic shock is present in 2.5% of patients of non ST elevated AMI. Frequency of cardiogenic shock in STEMI is 7.5% [10,11]. According to Jacobs AK et al, patients of non ST elevated AMI with cardiogenic shock have a greater risk profile than STEMI with cardiogenic shock though there is no difference in in-hospital mortality[9].

There is a clear male preponderance (68%) of affection of non ST elevated AMI in this study. Male preponderance affection of non ST elevated AMI with or without cardiogenic shock is also observed in a study done by Polonsk L et al [12] and Reynold et al [4].

Conclusion

Life threatening Cardiogenic shock occurs in 5% of patients with non ST elevated AMI. It is present more among in 61-70 years age group of people and more in male patients. Cardiogenic shock in non ST elevated AMI is relatively more common in our set up than internationally reported.

It is evident from this study that cardiogenic shock is not uncommon in Non-STEMI patients even in rural areas of this part of India. It is often undiagnosed and underreported in literature. Management of this condition should be done with equal emphasis to prevent mortality from potentially treatable condition.

Contribution by authors

SK Pal: Concept Design and Conducted the study and writing the manuscript.

D Sarkar: Conducted the study and writing the manuscript.

L Sarkar: Result analysis and statistical methods.

R Bandyopadhyay: Guiding the study procedure and preparing the manuscript for suitability for publication.

Funding: Nil, **Conflict of interest:** None

Permission of IRB: Yes

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How to cite this article?

Pal S. K, Sarkar D, Sarkar L, Bandyopadhyay R. Cardiogenic shock in Non-ST elevated AMI patients in a rural tertiary care hospital in Eastern India. *Int J Med Res Rev* 2017;5(12):1000-1003. doi:10.17511/ijmrr.2017.i12.05

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