

TO DETERMINE THREE MONTHS CLINICAL OUTCOMES AFTER ST ELEVATED MYOCARDIAL INFARCTION TREATED WITH FIBRINOLYSIS AMONG PATIENTS WITH LESS YEARS OF EDUCATION

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Contribution

YH & AA conceived the idea, MZUB & MHD planned the study and drafted the manuscript. FA & HJ helped in literature review. All authors contributed significantly in manuscript submission.

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ABSTRACT

Objective: To determine the frequency of three months mortality among patients with less than 8 years of education after acute myocardial infarction treated with fibrinolysis.

Methodology: This cross sectional study was conducted at Department of Cardiology, Lady Reading Hospital Peshawar from 16th April to 16th Oct 2013. Both male and female patients aged 18 years and above admitted with STEMI fulfilling inclusion criteria, were included in the study. Patients were divided into 2 groups on the basis of education whether less than or more than 8 years. Patients were subjected to detailed history and clinical examination. All patients were observed for mortality rate in 24 hours and in-hospital mortality (after 24 hours of hospital stay). Remaining patients were followed for 3 months mortality.

Results: A total of 482 patients who suffered acute STEMI and were treated with fibrinolysis were studied. The mean age was 60 ± 13.81 years. Among these males were 298 (61.8%). The frequency of 24 hours, in hospital and 3 months mortality after STEMI treated with fibrinolysis in Group A (<8 years of education) and Group B (>8 years of education) were 7.5% vs 2.5%, 13.9% vs 4.5% and 16.4% vs 7.0% respectively. The outcomes were statistically not significant for gender.

Conclusion: Level of education is a predictor of mortality after STEMI treated with fibrinolysis. Mortality after acute myocardial infarction is high in less educated patients.

Key Words: ST elevated Myocardial Infarction, years of education, 24hours mortality, In-hospital mortality, 3 months mortality.

INTRODUCTION

Coronary Artery disease (CAD) is an international health problem in both men and women and is the leading cause of death in the developed countries. The association between socioeconomic position and outcome of myocardial infarction (MI) is generally well documented in western countries indicating that those with lower socioeconomic status experience the most burden of the condition.¹ Given the attendant risks of mortality and morbidity, acute MI remains a principal focus of cardiovascular therapeutics. Moreover, 30-day mortality and re-hospitalization rates of acute MI are publicly reported in an effort to promote optimal acute MI care, and all aspects of MI care delivery are the focus of local, regional, and national quality initiatives.^{2,3} The prevalence of CAD is equally high in south Asia including Pakistan.⁴ In our local population of Peshawar, it is about 11.2% and is more prevalent in females (13.3%) than males (7.9%).⁵

Formal education is a measure of social position. There is evidence that it is a valid and reliable indicator for studies of association between health and social status in Iran.⁶ Recently the Isfahan Cardiovascular Research Centre (a WHO collaborating center for research and training in cardiovascular disease control in central Iran) carried out an analysis of available data of 12514 individuals and found that socioeconomic factors as measured by education, occupation and income were associated with cardiovascular risk factors. However, Education level was the strongest associated factor.⁷ Recently socio-economic status and two-years mortality rate after MI were analyzed among 664 MI patients who were hospitalized in Tehran Heart Center during one year. The results showed that education was a predictor of mortality among patients with MI. The lower educational level group (illiterate and primary) showed higher mortality risk compared to the higher level group.⁸ In addition there is evidence that years of education can strongly contribute in the distribution of several risk factors for CHD such as smoking and High Blood Pressure that may well inversely have an effect on the incidence and impact of MI attack.⁹

Another Study shows that One year mortality was inversely related to years of education and was 5-fold higher in patients with less than 8 years of education (17.5%), 24 hour mortality (5.2%) in hospital mortality (11%) and 30 days mortality (13.1%).¹⁰

The aim of this study is to know frequency of three months mortality among patients with reference to years of education, who had suffered Acute Myocardial Infarction treated with fibrinolysis. This study will help in analyzing whether less years of education is an independent predictor of mortality or a surrogate marker of measured or

unmeasured variables that are strongly related to mortality in patients with ST-Elevated Myocardial Infarction.

METHODOLOGY

This cross sectional study was conducted at Cardiology Department, Lady Reading Hospital Peshawar from 16th April to 16th Oct 2013. Non-probability consecutive sampling technique was used. Sample size was determined using 2.6 % margin of error under WHO software for sample size. Study population included all adult patients aged more than 18 years of either gender with acute ST Elevated Myocardial Infarction being treated with fibrinolysis.

Patients were divided into 2 groups on the basis of education that is less than and more than 8 years of education. Patients were subjected to detailed history and clinical examination. All patients were observed for mortality rate in 24 hours and in-hospital mortality (after 24 hours of hospital stay). Remaining patients were followed for 3 months mortality.

The diagnosis of acute myocardial infarction was based upon any two of the following features. a) History of prolonged chest pain more than 15 minutes not relieved by rest b) Cardiac enzyme elevation with raised Troponin I (>0.14mg/ml) via 3rd generation enzyme linked immunosorbent assay (ELISA) using Architect (1 2000SR) and c) ST-segment elevation of more than 1mm in at least two consecutive limb leads, 2mm or more in two consecutive chest leads.

The patients treated with primary PCI, having contraindications to thrombolysis, with all other causes of ST elevation other than STEMI like pericarditis, left ventricular hypertrophy and electrolyte imbalances were excluded. Patient who already had diabetes mellitus and hypertension, chronic liver disease, chronic renal failure and congestive cardiac failure were also excluded from the study.

Patients were thrombolysed with streptokinase in the Lady Reading Hospital Coronary care unit. All the patients were managed according to guidelines. All patients were followed within the hospital stay. Those who survived the hospital course were discharged on medications as indicated and were followed up to the end of third month to detect 3 month mortality.

All data was analyzed with SPSS version 20.0. Mean \pm SD was calculated for continuous variables. Frequencies and percentages were calculated for categorical variables. Mortality was stratified between gender and years of education to see the effect modifications. P value was calculated with Chi square test. All results were arranged and presented in the form of tables and graphs.

RESULTS

A total of 482 patients were enrolled in the study. Mean age was 60 ± 13.81 (30 – 85) years. Females were 184(38.2%) and males were 298 (61.8%). Based on years of education, patients were divided into two groups, Group A included patients with less than 8 years of education and Group B included patients with more than 8 years of education. The number of patients in group A was 281 (58.3%), and in Group B 201 (41.7%) as shown in table 1.

All STEMI patients were followed during their hospital stay for 24 hours mortality in CCU and then for in hospital mortality . Twenty four hours mortality, in-hospital mortality and 3 months mortality noted in these patients was 5.4 %,

10% and 12.4% respectively (Table 2).

Subgroup analysis showed an equal 24 hours mortality in males and females (5.4% vs 5.4%). In-hospital mortality rate was higher in females vs males but statistically insignificant. (11.4% vs 9.1%). Three months mortality rate was found to be equal for both male and female patients (12.4% each) (Table 3).

Twenty four hours mortality rate in Group A was 7.5% and 2.5% in Group B. In hospital mortality rate for Group A was 13.9% vs 4.5% in Group B. The remaining patients which were discharged on standard myocardial infarction treatment and were followed for 3 months mortality and observed for mortality in Group A and B(16.4% vs 7.0%).

Table 1: Demographic variables of Study Population (n=482)

OVERALL	
MEAN AGE(years)	60.32 ± 13.81 (30-85)
MALE %(n)	61.8% (298)
FEMALE % (n)	38.2% (184)
GROUP A(<8 years of education)%(n)	58.3% (281)
GROUP B(>8 years of education)(%)(n)	41.7% (201)

Table 2: Frequency of 24 Hours, In Hospital, Three Months Mortality In Patients with STEMI Treated with in Study Population. (n=482)

24 Hours Mortality	5.4% (26)
In Hospital Mortality	10% (48)
Three Months Mortality	12.4% (60)

Table 3: Gender wise Distribution of 24 Hours, In-Hospital and 3 Month in Study Population (n=482)

Time of Mortality		Gender		Total	p-value
		Male	Female		
Within 24 hours	n	16	10	26	0.866
	%	5.4%	5.4%	5.4%	
In-hospital Mortality	n	27	21	48	
	%	9.1%	11.4%	10.0%	
In 3 months	n	37	23	60	
	%	12.4%	12.5%	12.4%	
Survived	n	218	130	348	
	%	73.2%	70.7%	72.2%	
Total	n	298	184	482	
	%	100.0%	100.0%	100.0%	

Table 4: Comparison of Mortality and Years of in Study Population (n=482)

Mortality		Education		Total	p-value
		< 8 years	> 8 years		
Within 24 hours	n	21	5	26	0.000
	%	7.5%	2.5%	5.4%	
In-hospital Mortality	n	39	9	48	
	%	13.9%	4.5%	10.0%	
In 3 months	n	46	14	60	
	%	16.4%	7.0%	12.4%	
Survived	n	175	173	348	
	%	62.3%	86.1%	72.2%	
Total	n	281	201	482	
	%	100.0%	100.0%	100.0%	

Results for this comparison were highly significant (Table 4).

DISCUSSION

Acute myocardial infarction (MI) is a common medical emergency and is the leading cause of death worldwide.² Education was a predictor of mortality among patients with MI. The lower educational level group (illiterate and primary) showed higher mortality risk compared to the higher level group.

In our study 24 hours, in hospital and 3 months mortality among 2 groups of patients (Group A= less than 8 years of education, Group B= more than 8 years of education) after STEMI and Thrombolysis were studied. Twenty four hours mortality was 7.5% in Group A and 2.5% in Group B which is in close comparison to International data. Mehta et al included 2249 patients less than 8 years of education and reported 24 hours mortality of 5.2% (117) in their study.¹⁰

Similarly In hospital mortality was 13.9% in Group A and 4.5% in Group B in our study, as compared to the international data, there is a difference, but there is a close similarity in being statistically significant, indicating a high mortality rate in patients with less years of education. The probable reason for the difference might be their large sample size and secondly, not all of the patients in this study presented to hospital in time for thrombolysis, due to poor knowledge of acute MI and logistic problem so the chance of mortality was more in my patients.

In this study, patients were followed for 3 months, which showed a mortality of 16.4% in Group A and 7% in Group B. This also shows similarity with other studies as Mehta et also showed a greater 30 days mortality in patients with less years of education.¹⁰

In comparison with another study, MILIS (Multicenter Investigation of Limitation of infarct size), Tofler et al studied 453 patients who have completed high school and 363 patients who have not completed after Acute Myocardial

Infarction.¹¹ The study showed In-hospital mortality of 5 % in high school group versus 13% in the second group. These results are almost similar to this study.

Similarly, In BHAT(Beta-blocker in Heart Attack Trial), Ruberman et al studied 1739 male patients after acute MI and found an inverse relationship between education and mortality after MI. This relationship was explained on the basis of high prevalence of social isolation and high degree of stress in less educated people.¹²

Kotke et al reported high rates of reinfarction in their study of hospitalized survivors among patients with less years of education in North Carolina.¹³

Donyavi et al showed that survival after MI varied with socio-economic status and analyzed a two-year mortality rate among 664 MI patients who hospitalized in Tehran Heart Center during a one complete calendar year. After adjustment for demographic, clinical and socio-economic variables, education was a predictor of mortality among patients with MI. The lower educational level group (illiterate and primary) showed higher mortality risk compared to the higher level group.⁸

Studies showed that patients with lower educational levels experience lower survival rates after an acute MI attack.¹⁴ In addition there is evidence that years of education can strongly contribute in the distribution of several risk factors for CHD such as smoking and HBP that may well inversely have an effect on the incidence and impact of MI attack.⁹

Higher SES patients experienced significantly greater post-AMI functional recovery than did their socioeconomically disadvantaged counterparts. Functional recovery was the strongest modifiable predictor of long-term mortality irrespective of SES, and explained nearly 30% of the association between SES and long-term mortality after AMI.¹⁵

In this study higher mortality in less educated patients may have been contributed by late presentations, longer time to treatment, non-compliance with medications and no proper

follow-up visits. This study showed that education is a predictor of short term mortality. Improving education has potential to improve health outcomes of patients.

LIMITATIONS

This study involves only small number of patients which might have affected the outcomes of the patients. Larger studies are required to prove this inverse relationship between education and mortality after STEMI. Other domains of socioeconomic status like poverty, job etc were not assessed in predicting mortality among these patients. Since this was a short term study, longer follow up is required to see effect of education on mortality. Morbidity is increased in less educated patients as evidenced by previous study which is not checked in this study.

CONCLUSION

Years of education has an impact on the mortality of patients after STEMI treated with fibrinolysis. Less years of education is inversely related with higher short term mortality. However, further study is required to prove this relationship and mechanism underlying this association between socioeconomic status and cardiovascular outcomes.

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