Thrombolytic therapy use for acute myocardial infarction and outcome in Qatar☆

Hadi A.R. Hadi[a], J. Al Suwaidi[a,*], A. Bener[b], A. Khinji[a], H.A. Al Binali[a]

[a]Department of Cardiology and Cardiovascular Surgery, Hamad General Hospital, Hamad Medical Corporation, P.O. Box 3050 Doha, Qatar
[b]Department of Biostatistics and Epidemiology, Hamad General Hospital, Hamad Medical Corporation, Doha, State of Qatar

Abstract

Objective: Data on the outcome of patients treated with thrombolytic therapy in the Arab world is scarce. The main objective of this study is to study the 7-day morbidity and mortality rate and the rate of use of thrombolytic therapy in patients presenting with acute myocardial infarction treated with thrombolytic therapy in the Middle East.

Methods: We conducted a retrospective analysis of prospectively collected data for all patients who were admitted to Coronary Care Unit in Cardiology Department in Hamad Medical during the period (1991–2001). Patients were divided into two groups in relation to ethnicity whether they received thrombolysis or not. In each group, the number of patients, age at the time of admission, gender, cardiovascular risk profile, therapy and outcome in regard of in-hospital complication and 7-day death as primary end point were analyzed.

Results: Of the total 5388 patients admitted with acute myocardial infarction during the 10-year period, 66.3% (3567) with STE MI were found, 61.4% (2190) of them received thrombolytic therapy while 38.6% (1377) were not eligible for thrombolytic therapy. The remaining 33.7% (1821) were admitted with non-STE MI. In consideration of ethnic variation, patients with STE MI eligible for thrombolytic therapy, 29.6% (1598) were Qataris and 70.4% (3792) were non-Qataris. Thrombolytic therapy was administered to 25.9% (414) of Qatari patients and 51.3% (1947) of non-Qataris. The mortality rate of Qatari patients who received thrombolytic therapy was 9.2% (38) vs. 19.5% (231) who did not receive thrombolytic therapy ($p<0.001$). In non-Qatari patients, the mortality rate was 5.2% (102) for those who received thrombolytic therapy, while it was 8.6% (159) for those with no thrombolytic therapy ($p<0.001$). When compared to male patients, female patients with thrombolytic therapy had higher mortality rates (in both Qataris and non-Qataris) (20.5% vs. 6.1%; p value<0.001 and 16.1% vs. 9.4%; $p<0.001$, respectively), there were no significant differences between the ethnic groups in regard to in-hospital complications. Patients treated with thrombolytic therapy had lower incidence of in-hospital complication regarding acute heart failure, post-myocardial angina, heart block and arrhythmia. Thrombolytic therapy reduced mortality rate in acute myocardial infarction by 69%. Logistic regression analysis had shown that arrhythmia, acute heart failure, heart block, cardiogenic shock, diabetes mellitus and stroke were independent predictors of increased mortality. Thrombolysis was used in 61.4%, which is still underutilized when compared to a few available studies in the Gulf area, and to other studies in the developed world.

Conclusion: In the current study, use of thrombolysis in acute myocardial infarction was associated with significant decrease in in-hospital mortality and morbidity. Mortality rate was higher in the Qatari nationals when compared to non-Qataris. Reperfusion therapy may be underutilized in the developing world. Increased use of reperfusion therapy would result in reduced mortality rate. Global measures to encourage the use of reperfusion therapy including patients' education, and strategies to improve the health care system are needed.
© 2004 Elsevier Ireland Ltd. All rights reserved.

Keywords: Coronary heart disease; Myocardial infarction; Unstable angina; Thrombolytic therapy

1. Introduction

Clinical use of intravenous preparations containing streptokinase for acute myocardial infarction dates back

---

four decades [1,2]. However, contemporary interest in intravenous thrombolytic therapy was reawakened with reports in the mid-1980s of its feasibility and comparability to intracoronary therapy [3–5]. Subsequently, the landmark study of De Wood and colleague published in 1980, demonstrated complete presumably thrombotic occlusion of infarct-related artery in 87% of patients with myocardial infarction (MI) and ST elevation studied angiographically within 4 h of onset of the symptoms and in 65% studied between 12 and 24 h. It is now well established that thrombolytic therapy provides a survival benefit for patients with acute MI based on large well-controlled trials.

In an overview of nine controlled randomized trials involving more than 1000 patients, a highly significant 18% proportional reduction in mortality was observed. Data in the outcome of patients with acute myocardial infarction receiving thrombolysis in the developing world is lacking. The aim of the study is to evaluate the percentage of patients with myocardial infarction who receive thrombolytic therapy and their outcome over a 10-year period.

This study was conducted in the State of Qatar, the Persian Gulf. The estimated population of State of Qatar for the year 2001 is 595,321. Approximately 30% of the population are Qatari nationals, 95% of which are Muslims, and the rest are expatriates, mostly from the Middle East, South Asia and South East Asia. The State of Qatar, like many other developing countries, has witnessed a rapid development in many aspects of life during the last two decades. The discovery of oil in the middle of the last century has changed many aspects of life in Qatar. Epidemiological transition has already occurred in this community; a sharp decline in infectious and nutritional deficiency diseases and a gradual increase in chronic diseases have occurred in this country. In the last decade of the 20th century, cardiovascular diseases are the leading causes of morbidity and mortality in Qatar and this trend is increasing [6–9].

2. Materials and methods

2.1. Study setting

This study was based at Hamad General Hospital, Doha. This hospital provides inpatient and outpatient medical and

Table 1
Socio-demographics, baseline characteristics and biochemical profile of patients with thrombolysed STE MI and non-thrombolysed STE MI and non-STE MI

Variables		STE MI with thrombolysis	STE MI without thrombolysis	Non-STE MI
Frequency		2190	1377	1821
Gender***	male	2053 (93.7)	1165 (84.6)	1517 (83.3)
	female	137 (6.3)	212 (15.4)	304 (16.7)
Nationality***	Qatari	383 (17.5)	534 (38.8)	681 (37.4)
	non-Qatari	1807 (82.5)	843 (61.2)	1140 (62.6)
Age group***	<30	27 (1.2)	14 (1.0)	13 (0.7)
	30–39	318 (14.5)	143 (10.4)	148 (8.1)
	40–49	902 (41.2)	349 (25.3)	477 (26.2)
	50–59	662 (30.2)	345 (25.1)	572 (31.4)
	60–59	227 (10.4)	293 (21.3)	380 (20.9)
	70–79	41 (1.9)	165 (12.0)	177 (9.7)
	≥80	13 (0.6)	68 (4.9)	54 (3.0)
History	angina***	1450 (66.2)	622 (45.2)	934 (51.3)
	dizziness*	12 (0.5)	20 (1.5)	22 (1.2)
	palpitation***	5 (0.2)	18 (1.3)	25 (1.4)
	atypical chest pain**	19 (0.9)	27 (2.0)	36 (2.0)
	non-cardiac complaint	23 (1.1)	27 (2.0)	23 (1.3)
	shortness of breath***	45 (2.1)	157 (11.4)	300 (16.5)
Risk factors	smoking	480 (21.9)	124 (9.0)	198 (10.9)
	diabetes mellitus***	628 (28.7)	534 (38.8)	704 (38.7)
	hypertension***	398 (18.2)	393 (28.5)	637 (35.0)
	hypercholesterolemia***	597 (27.3)	292 (21.2)	477 (26.2)
	CABG	43 (1.8)	116 (3.8)	<0.001
	old MI***	117 (5.3)	157 (11.4)	305 (16.7)
Lab data (mean±SD)	total cholesterol***	5.3±2.7	4.7±2.4	5.0±1.9
	HDL-cholesterol[†]	1.1±0.6	1.06±0.8	1.1±0.6
	triglyceride***	2.0±1.5	1.7±1.6	1.9±1.7
	CPK***	1024.9±550.5	753.2±539.8	663.1±426.5
	troponin[†]	1.2±0.4	1.2±0.4	1.2±0.4

STE MI=ST-elevation myocardial infarction; non-STE MI=non-ST elevation myocardial infarction.

   * $p<0.05$.

  ** $p<0.01$.

 *** $p<0.001$.

   [†] NS=not significant.