



One-Year Outcome of Patients with Acute Myocardial Infarction

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Abstract

Background: Cardiovascular disease (CVD) is the leading cause of mortality and morbidity worldwide. Acute myocardial infarction (AMI) represents the most dramatic presentation of CVD and is one of the most commonly seen acute medical emergencies. According to Iran's Ministry of Health, 966,779 people (46%) died of CVD and 575,257 (27%) potential years of life were lost to CVD in 2000. We, therefore, set out to evaluate the one-year outcome of the patients admitted to Loghman-Hakim Hospital between 2003 and 2004.

Methods: This historical cohort study selected patients that had been discharged from hospital a year earlier. The subjects were asked by telephone to come to the hospital so that their records could be assessed, and data on the following categories were extracted: coronary angiography results, revascularization (percutaneous coronary intervention [PCI], coronary artery bypass grafting [CABG]), re-admission, mortality and drug compliance.

Results: Among 132 AMI patients at a mean age of 59.2 years, 76.5% were male. Seventy nine point five percent of all the patients had had ST-elevation myocardial infarction (STEMI) and 20.5% non-STEMI. Fifty-eight percent of the subjects had received streptokinase and 42.4% had undergone cardiac catheterization. Revascularization had been performed on 12.8% via PCI and on 21.2% through CABG. The mortality and re-admission rates within one year of treatment stood at 6.1% and 14.3%, respectively. One year after discharge, the respective rates of drug compliance with beta-blockers, ASA, ACEI and statins were 74.2%, 98.5%, 71.2% and 67.4%.

Conclusion: Patients with AMI show satisfactory long-term drug compliance. Our patients' mortality rate was comparable to that in other studies, and their adherence to prescribed medicines and recommended procedures (PCI, CABG) was relatively high.

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Introduction

In recent decades, coronary artery disease (CAD) has become the leading cause of death worldwide. Acute myocardial infarction (AMI) is known to be one of the biggest problems of ischemic heart disease (IHD), and for all

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the progress made in the treatment of CAD in recent years, it remains the main cause of mortality in developed and underdeveloped countries.

According to WHO's report (The World Health Report 2002: Reducing risks promoting healthy life. Geneva WHO; 2002) in 2001, 7,200,000 people lost their lives as a result of heart disease in the world; 78% of these deaths occurred in underdeveloped countries. At the same time, heart diseases caused 59,000,000 years of potential life lost in 2001, 86% of which took place in underdeveloped countries.

According to Iran's Ministry of Health report (The picture of death in 18 provinces of Iran in 2000, Iran Ministry of Health and Medical Educations publications. 2002), 966,779 people (46%) died of CAD and 575,257 (27%) potential years of life were lost in 2000. Nowadays, the use of percutaneous coronary intervention (PCI) and coronary artery bypass grafting (CABG) in conjunction with appropriate and timely drug therapy has lessened AMI-related deaths by one-third.

Methods

This historical cohort study selected patients with AMI who had been discharged from Tehran Loghman Hakim Hospital one year previously, i.e. between November 2003 and 2004. The patients were recruited over the telephone for an evaluation of their records on the following categories: 1) mortality rate; 2) coronary angiography; 3) re-admission; 4) revascularization by PCI and CABG on indication; and 5) drug compliance.

The patients with one of the following criteria had undergone coronary angiography: 1) 1-14 days post MI angina; 2) sustained ventricular tachycardia (VT) or ventricular fibrillation (VF) after 48 hours of MI; 3) congestive heart failure (CHF) symptoms and signs or ejection fraction (EF) ≤ 40%; and 4) positive exercise tolerance test (ETT) or myocardial perfusion scan.

The above data were analyzed with SPSS 13.

Results

The research was carried out on 132 patients out of a total of 166 patients who had been discharged from hospital during the period in mind. The subjects, 101(76.5%) males and 31(23.5%) females, had a mean age of 59.2 years (standard deviation [SD]=13.1 years). Of all our patients, 105 had had ST-elevation myocardial infarction (STEMI) and 27 non-STEMI.

The frequencies of the risk factors; namely, hypertension, diabetes mellitus, current smoking, previous MI and cerebrovascular accident (CVA), were 28%, 21.2%, 32.6%, 10.6% and 3%, respectively.

The anatomical locations of AMI are depicted in Table1.

Table 1. The anatomical locations of myocardial infarction (MI)

MI Location	Frequency	Percent
Anterior (V1-V4)	16	12.1
Anterior, Inferior	3	2.3
Anteroseptal (V1-V2)	15	11.4
Anterolateral (V4-V6)	5	3.8
Extensive Anterior (V1-V6, I, aVL)	16	12.1
Inferior (II, III, aVF)	37	28.0
Inferior, RV (II, III, aVF, V3R-V6R)	6	4.5
Inferolateral (II, III, aVF, V4-V6)	5	3.8
Inferoposterior (Inf + tall R V1 or V2)	5	3.8
Inferoposterolateral	1	0.8
Non-specified	2	1.5
Non-ST-elevation MI	21	15.9
Total	132	100.0

The average of left ventricular ejection fraction (LVEF) was 43.3%. From 105 patients with STEMI, 58.1% of them had received streptokinase (SK). Sixty-two patients had been initially candidates for coronary angiography, which had been finally carried out in 90.3% of them. The results of angiography were single-vessel (17.8%), 2-vessel (26.7%), 3-vessel (53.5%) and multi-vessel disease (1.8%).

Fifty-nine patients had been selected for CABG and PCI based on indications, which are represented by Figures 1 and 2, respectively.

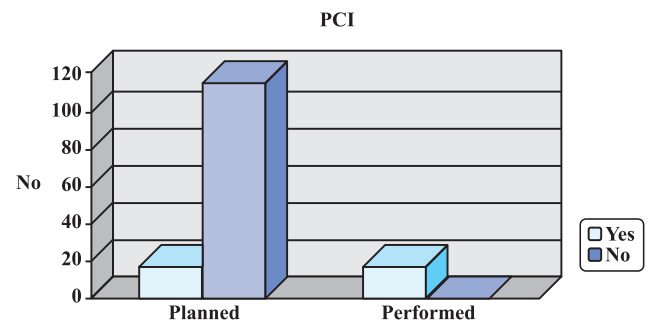


Figure 1. The number of patients with percutaneous coronary intervention (PCI)

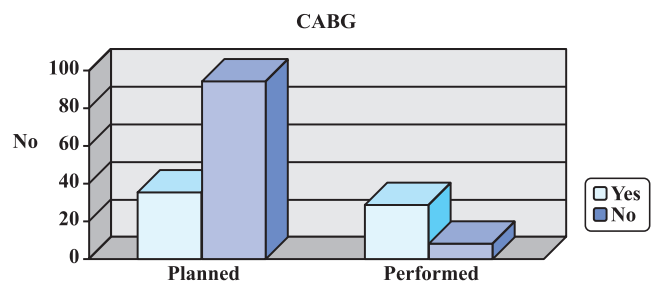


Figure 2. The number of patients who underwent coronary artery bypass grafting (CABG)

Within a year, 19 patients had been readmitted: eight patients due to angina pectoris, six due to congestive heart failure exacerbation, two due to palpitation (one with VT and the other with AF) and the remaining three due to cerebrovascular disease. It is worthy of note that for different



reasons access to 34 patients was not possible, which precluded the determination of the exact number of those who had been re-admitted.

Among the smokers, 16.2% had completely quit smoking and 27.9% had given up on a temporary basis.

Eight patients (6.1%) had died within one year after discharge: all were male and older than sixty years, 4 of them had had STEMI (two receiving SK) and the other 4 NSTEMI. No significant relation was found between mortality and age, sex, hypertension, diabetes mellitus, smoking, drug consumption and thrombolytic therapy presumably because of our low sample volume.

The rates of drug compliance with ASA, beta-blockers, ACEI and statins a year after discharge were 98.5%, 74.2%, 71.2% and 67.4%, respectively.

Discussion:

It was observed in the course of this study that AMI had occurred mostly in male patients. Other studies have yielded the similar results.¹⁻⁴

In our study, 25.7% of the patients were in their fifth decade; and by comparison with other studies, such risk factors as diabetes mellitus and high blood pressure had occurred earlier in them.^{1,2,5}

Additionally, reperfusion had been performed with SK in 58.1% of our patients. The reasons for not receiving SK are as follows: 26 (24.8%) of the patients due to a delay, 8 (7.6%) due to misdiagnosis, 5 (4.7%) due to BP>200/110 mmHg, 3 (2.8%) due to a recent CVA, 1 (0.9%) due to recent eye surgery and another one (0.9%) due to prolonged cardiopulmonary resuscitation.

In the Schiele F et al.² study in France, 77.5% of their patients received thrombolytic therapy. The skills of emergency medical staff, the timely arrival of victims to hospital and availability of necessary diagnostic and therapeutic procedures and especially cardiologists for decision-making in opting for thrombolytic therapy are the key factors that can explain this difference.^{6,7} The use of thrombolytic therapy can be increased by raising public awareness of AMI symptoms especially among those at higher risk, namely the elderly, smokers, diabetics, and hypertensives, as well as by providing necessary equipment and transportation facilities for the timely transfer of patients to emergency departments with adequately trained medical staff.

Forty-two point four percent of our patients had undergone coronary angiography, 12.8% PCI and 21.2% CABG. In the Tesak et al.⁵, 9% of their patients underwent PCI and 16% CABG. In the Mehta et al.¹ study, 59.3% underwent coronary angiography, 22.6% PCI and 10.6% CABG.

A comparison between our patients and those in other studies^{1,2,8,9} with respect to drug compliance is made in Table 2.

Table 2. A comparison between different studies with respect to drug compliance

STUDY DRUG	O'Neill et al	Prabhakaran et al	Mehta et al	Schiele et al	Our study
ASA	81	98.2	93.3	100	98.4
β-blocker	41	72.1	75	47	72.4
Statin	-	-	-	99	67.4
ACEI	-	-	20.2	68	71.2

*Data are presented as percentage

ASA, Acetylsalicylic acid; ACEI, Angiotensin converting enzyme inhibitors

The low use of beta-blockers in the Schiele F et al.² study was due to chronic obstructive pulmonary disease and bradycardia. The reasons for the high use of ACEI in our study, however, were EF<40%, which was present in 31% of our patients, and hypertension, which existed in 28%.

Drug therapy compliance in our patients was high compared to that in other studies, which could be the result of the proper training of the patients.

Unfortunately, 6.1% of our patients had died within one year after discharge from hospital. In the Prabhakaran D et al.⁹ during two-year follow-up of their patients, 9.9% had died; Yan et al.¹⁰ in Canada reported the death of 6.5% of their subjects, and 11.5% of the patients of the Schiele F et al.² study in France had died during a one-year follow-up.

As was previously mentioned, the most prevalent reason for some of our patients' not have received SK was delay. Consequently, mortality in their case must have occurred before hospitalization. This idea could affect our study mortality. As for the 34 patients whom we were not able to access, we contacted the Tehran Behesht-e-Zahra Cemetery, there was no record of these patients there.

Conclusion

Our patients' mortality rate was comparable to that in other studies and their long-term adherence to prescribed medicines and recommended procedures (PCI, CABG) was relatively high. Be that as it may, in comparison with studies carried out in developed countries we had more patients lost to follow-up, which was the result of a lack of integrated database in Iran.

It is essential that an integrated database be established to record patient data in hospitals and during their follow-up anywhere in our country. Also, it is advisable that, in addition to the telephone number of the patients, we obtain the numbers of some of their relatives as well so that we could have fewer patients lost to follow-up.



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