Non-administration of thrombolytic agents in acute myocardial infarction patients in Hajar hospital, Shahrekord, Iran: prevalence rate and causes

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Short Communication

Abstract

BACKGROUND: Cardiovascular diseases are the major causes of mortality worldwide and acute myocardial infarction (AMI) is the leading cause of mortality among cardiovascular diseases. Thrombolytic therapies, especially during the first few hours after the disease onset, can significantly reduce AMI-related mortality.

METHODS: The current study aimed to determine the prevalence and causes of non-administration of thrombolytic therapy for AMI patients admitted to Hajar Hospital, Shahrekord, Iran, from May until November 2000. Non-probability convenient sampling method was used to select 106 subjects with Q-wave AMI. Data was collected by completing a questionnaire, reviewing medical records, and interviewing with patients. $SPSS_{7.5}$ was for data analysis.

RESULTS: A total number of 106 AMI patients were studied among whom 62 (59%) individuals received thrombolytic therapy. Delayed referral to the hospital was the major cause of failure to provide thrombolytic therapy. The cause of non-treatment could not be identified in 15 (19.5%) subjects eligible to receive therapy.

CONCLUSION: Training general practitioners and individuals involved in this regard along with accelerating the process of patient referral to hospitals can reduce AMI-related mortality.

Keywords: Acute Myocardial Infarction, Thrombolytic, Therapy

Introduction

Cardiovascular diseases (CVDs) are the leading causes of mortality in the world. In fact, they cause 50% of mortalities in developed countries and 25% of mortalities in developing countries.[1] Acute myocardial infarction (AMI) is responsible for most mortalities due to CVDs. In the U.S., more than one million people diagnosed with AMI are annually admitted in hospitals. Almost one-third of these patients die.[2]

Like many other countries, CVDs are the main cause of mortality in Iran and heart attacks occur during the 4th and 5th decades of patients' lives.[3] In recent years, thrombolytic therapies could reduce the MI-related mortalities from 15% to approximately 6.5%. In addition to mortality reduction,

thrombolytic therapies can also lessen disease symptoms and complications such as interventricular septal rupture and cardiogenic shock.[4]

In order to be effective on mortality, thrombolytic therapies are suggested to be administered until 12 hours after the onset of AMI.[5] In addition to the time limit, patients should not have the contraindication prescription. The most important thrombolytic drug contraindications are active internal bleeding, cerebrovascular events in the past one year, possibility of aortic dissection, and history of intracerebral hemorrhage.[5] Despite the approved role of thrombolytic therapy in AMI, it is still not administrated in many hospitals for all the patients. Venturini et al. collected information from ten countries and found that 37.3% of patients

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with AMI did not undergo thrombolytic therapy mainly due to delayed referral.[5] In another study, race was shown to have influenced the percentage of thrombolytic therapy administration, i.e. while 75% of Caucasians admitted with AMI volunteered and received thrombolytic therapy, only 62% of black patients underwent treatment.[6] Furthermore, some studies have suggested the administration rate of thrombolytic therapy to be lower in women than men with AMI. The reason might be delayed referral of women to hospitals, higher age among women with AMI, the existence of comorbidities which did not make women as appropriate volunteers for thrombolytic therapies, or differences in quality of services provided to female and male patients.[6-8] In another study, the rate of thrombolytic therapy was higher in patients treated by a cardiologist than by a general practitioner or internist which indicates the impact of specialty of physicians on administration rate of thrombolytic drugs.[9]

The administration rate of thrombolytic therapy to candidates with AMI might indicate the quality of the provided services to patients. Therefore, all health care centers should pay utmost attention to administer such drugs to AMI patients. However, no previous report has been published about the frequency of non-administration of thrombolytic therapies in the province of Chaharmahal-e-Bakhtiari (Iran). Due to the high value of thrombolytic drugs as major pharmacological therapies in patients with AMI, this study aimed to determine the prevalence rate and causes of non-administration of thrombolytic therapies.

Materials and Methods

This was a prospective, descriptive, cross-sectional study. The study population included all the patients with MI admitted in coronary care unit (CCU) of Hajar Hospital, Shaherkord, Iran during May-November 2000. AMI was diagnosed by a cardiologist based on indicators of the World Health Organization including history of chest pain, echocardiographic changes, and increased cardiac enzymes.[4] Non-probability convenient sampling method was used to select subjects. Overall, 106 patients diagnosed with Q-wave AMI were examined in terms of administration or non-administration of thrombolytic therapies. Data was collected by completing a questionnaire, reviewing medical records, and interviewing with patients. Data was extracted, categorized and analyzed by proportions difference test in $SPSS_{7.5}$. In order to compare the findings, P less than 0.05 were considered as significant.

Results

As indicated in table 1, the numbers of male patients were more than females. Among the 106 studied patients 62 (59%), including 54 males (87.1%) and 8 females (22.9%), received thrombolytic therapy.

Out of 44 patients who did not receive streptokinase, 18 (41%; 11 males and 7 females) referred late, 11 (25%; 6 males and 5 females) had contraindications, and 15 (34%; 9 males and 6 females) did not mention any special reasons while they were candidates for thrombolytic therapy.

Although a total number of 77 patients were candidates to receive thrombolytic therapy, only 62 (80.5%) received the treatment. To be more precise, 89% of men and 62% of women underwent thrombolytic therapy.

Discussion

As indicated in the results of the study, AMI was more prevalent in men, i.e. the number of men was three times more than women. Sex-dependent differences have also been indicated in other studies. In a large study on more than 3600 AMI patients, only 26% of the patients were female.[10] Therefore, being male is known as a risk factor for the incidence of coronary artery diseases and AMI. In this study, mean age of women was higher than men. In most previous studies, females aged higher than males.[8,10]

Table 1. Demographic characteristics of patients and summarized results in male and female patients

Number of patients	Males 80 (75.5%)	Females 26 (24.5%)
Mean age (year)	60.5	64.7
Those who did not received thrombolytic therapy	26 (32.5%)	18 (69.2%)
Candidates of receiving thrombolytic therapy	63 (78.8%)	14 (53.9%)
Candidates for thrombolytic therapy who did not receive it	9 (14.3%)	6 (42.9%)
Patients who did not receive thrombolytic therapy due to delayed referral	11 (13.8%)	7 (26.9%)
Patients who did not receive thrombolytic therapy due to contraindications	6 (7.5%)	5 (19.2%)

Males and females were significantly different in all groups (P < 0.05).

According to our findings, 59% of all AMI patients were treated with streptokinase while 41% did not receive any thrombolytic drug. Male and female patients were significantly different in terms of receiving thrombolytic drugs (67.5% vs. 30.5%; P < 0.05). A study in Spain reported 23.9% of women and 41.3% of men with first AMI to have received thrombolytic therapy. Although we found higher percentages, the two studies found a higher prevalence among men.[10]

In addition, 80.5% of patients eligible to receive thrombolytic therapy did not receive it. Since the rates were 90% in men and 32% in women, a significant difference was observed between the two sexes (P < 0.05), which can be justified by the lower prevalence of AMI among women due to delayed diagnosis and treatment. Another reason for lower frequency of thrombolytic therapies administration in women might have been their older age compared to men. On the other hand, the percentage of women who did not receive thrombolytic drug due to contraindications was significantly higher than men. Differences in the frequency of thrombolytic therapy administration between men and women have also been mentioned in previous studies.[8,10]

The overall rate of thrombolytic therapy administration to the eligible patients seems to be lower in this study compared to some other research. For instance, a study reported 93% of patients treated by a cardiologist to have received thrombolytic drugs.[9]

In this study, the most prevalent cause of non-administration of thrombolytic therapy was delayed referral. There was no significant difference between men and women in this regard. It can be justifiable given that Chaharmahal-e-Bakhtiari is a mountainous province and sometimes it takes patients hours to get to the hospital. Moreover, such therapies are currently accessible only in hospitals and administration of the drugs is not possible in emergency stations and ambulances. Previous studies have also indicated the most prevalent cause of non-administration of thrombolytic therapy as delayed referral.[11-13]

Therefore, in order to provide better health care services and treatment to patients with AMI, all the emergency physicians, who are somehow involved in treatment of such patients, are recommended to be trained with the required educations about pharmacological therapy. Moreover, providing emergency centers with necessary facilities for early diagnosis of AMI and administration of thrombolytic therapies can prevent the mentioned delays. Furthermore, public educations of AMI symptoms, particularly to those at risk including elderly people, smokers and diabetics, can lead to earlier referral of patients to hospitals.

Acknowledgments

Conflict of Interests

Authors have no conflict of interests.

References

1. Gaziano JM. Global burden of cardiovascular disease. In: Braunwald E, Zipes DP, Libby P, Editors. Heart Disease: A Textbook of Cardiovascular Medicine. 6th ed. Philadelphia, PA: Saunders; 2001.

2. Antman EM, Braunwald E. Acute myocardial infarction. In: Braunwald E, Zipes DP, Libby P, Editors. Heart Disease: A Textbook of Cardiovascular Medicine. 6th ed. Philadelphia, PA: Saunders; 2001.

3. Barzigar A, Shamkhani K, Hossein Akbar M, Bolourchian MJ, Hemati H, Atrkar Roushan Z, et al. Epidemiologic review of patients with acute myocardial infarction referred to Heshmat Hospital during five years. J Guilan Univ Med Sci 1992; 1(4): 8-27. [In Persian].

4. Becker RC, Gore JM, Lambrew C, Weaver WD, Rubison RM, French WJ, et al. A composite view of cardiac rupture in the United States National Registry of Myocardial Infarction. J Am Coll Cardiol 1996; 27(6): 1321-6.

5. Venturini F, Romero M, Tognoni G. Patterns of practice for acute myocardial infarction in a population from ten countries. Eur J Clin Pharmacol 1999; 54(11): 877-86.

6. Manhapra A, Khaja F, Syed M, Rybicki BA, Wulbrecht N, Alam M, et al. Electrocardiographic presentation of blacks with first myocardial infarction does not explain race differences in thrombolysis administration. Am Heart J 2000; 140(2): 200-5.

7. Gan SC, Beaver SK, Houck PM, MacLehose RF, Lawson HW, Chan L. Treatment of acute myocardial infarction and 30-day mortality among women and men. N Engl J Med 2000; 343(1): 8-15.

8. Marrugat J, Sala J, Masia R, Pavesi M, Sanz G, Valle V, et al. Mortality differences between men

and women following first myocardial infarction. RESCATE Investigators. Recursos Empleados en el Sindrome Coronario Agudo y Tiempo de Espera. JAMA 1998; 280(16): 1405-9.

9. Go AS, Rao RK, Dauterman KW, Massie BM. A systematic review of the effects of physician specialty on the treatment of coronary disease and heart failure in the United States. Am J Med 2000; 108(3): 216-26.

10. Randomised trial of late thrombolysis in patients with suspected acute myocardial infarction. EMERAS (Estudio Multicéntrico Estreptoquinasa Repúblicas de América del Sur) Collaborative Group. Lancet. 1993; 342(8874): 767-72.

11. Bayes de LA. International cooperation in world cardiology: the role of the World Heart Federation. J Am Coll Cardiol 1999; 33(5): 1427-30.

12. Douglas PS. Coronary disease in women. In: Braunwald E, Zipes DP, Libby P, Editors. Heart disease: a textbook of cardiovascular medicine. 6th ed. Philadelphia, PA: Saunders; 2001.

13. Rawles J, Sinclair C, Jennings K, Ritchie L, Waugh N. Call to needle times after acute myocardial infarction in urban and rural areas in northeast Scotland: prospective observational study. BMJ 1998; 317(7158): 576-8.

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