Original Article

Causes of Pre-Hospital Delay in Patients with Acute Myocardial Infarction

Bilquis Shabbir,[1] **Rizwan Amjad,**[2] **Furqan Saeed,**[3] **Kashif Nawaz,**[4] **Sakhawat Abbas**[5]

Abstract

Objective: To determine the factors influencing the delay in presentation of symptomatic patients of acute myocardial infarction at hospital emergency department.

Study Design: An observational study.

Place and Duration of Study: Department of Medicine, Mayo Hospital, King Edward Medical University, Lahore, from June, 2010 to June 2011.

Methodology: 300 patients were included in the study with the following criteria: symptomatic myocardial infarction uncomplicated by cardiac arrest, age less than 70 years and presentation less than 24 hours after onset of chest pain. Myocardial infarction was defined as history of characteristic chest pain with either an ECG showing standard changes of myocardial infarction, and / or a rise in cardiac markers of more than double the upper normal range. After informed consent, the following data was collected from the subjects and entered in a structured proforma: patient demographics, previous cardiac and medical history, duration of delay, type of delay, the reason for the delay and the first response of the patient. SPSS 19 was used to analyze the data and the results were described in term of descriptive statistics.

Results: Amongst the total of 300 patients, 234 (78%) were males and 66 (22%) were females. Age ranged between 31 – 66 years. 204 (68%) had no previous cardiac history, 24 (8%) had suffered from angina alone and 72 (24 %) had been diagnosed to have had MI previously. One hundred fifty six (52%) were hypertensive, 72 (24%) were diabetic, 66 (22%) had both hypertension and diabetes mellitus. Twenty four (8%) had previously suffered from a cerebrovascular accident, 12 (4%) were having hyperlipidemia and 6 (2%) had an underlying vasculitic disorder. 174 (58%) had delayed decision time, while 120 (40%) had delayed response time; only 6 (2%) presented within ½ hour of chest pain. The commonest reason (70%) for patient's delay in presentation was that they thought it was not serious and would settle on its own. Maximum number of those having chest pain (44%) presented directly to the hospital emergency.

Conclusion: Factors including patient's demographic, past medical history, clinical presentation, recognition of symptoms, and the first contact approached for help

Shabbir B.[1]
Associate Professor, Department of Medicine
King Edward Medical University, Lahore

Amjad R.[2]
PG trainee, Medicine, KEMU, Lahore

Saeed F.[3]
PG trainee, Medicine, KEMU, Lahore

Nawaz K.[4]
PG trainee, Medicine, KEMU, Lahore

Abbas S.[5]
PG trainee, Medicine, KEMU, Lahore

affect the duration of prehospital delay in patients with acute myocardial infarction.

Key Words: Acute myocardial infarction (AMI), delay, presentation.

Introduction

It is well established that early administration of thrombolytic therapy and other myocardial reperfusion strategies result in improved survival after AMI. The benefits of therapy diminish as the time delay between onset of infarction and administration of therapy increase.[1] This delay can be considered to consist of two parts; the time from infarction to the patient deciding to seek medical help (decision time); and the time from the decision to seek medical help to arrival at hospital (response time).[2]

The aim of this study is to determine the factors influencing the delay in presentation of symptomatic patients of AMI at hospital emergency department.

Material and Method

The study was carried out in the Medical Department of Mayo Hospital, King Edward Medical University, Lahore, from June, 2010 to June 2011. A total of 300 patients were included in the study. The criteria for including patients in the study were: symptomatic myocardial infarction uncomplicated by cardiac arrest, age less than 70 years and duration of presentation less than 24 hours after onset of chest pain. Criteria for defining myocardial infarction included: history of characteristic chest pain with either an ECG showing standard changes of myocardial infarction, and / or a rise in cardiac markers of more than double the upper normal range.

After taking informed consent, the following data was collected and entered in a proforma:

- Patient demographics.
- Previous cardiac and medical history.
- Duration of delay.
- Type of delay i.e. delayed decision or response time.
- Reason for the delay; whether he/she thought it was not serious or would settle on its own, tried self treatment at home, waited for a second lay opinion or tried to avoid presenting because of fear of the unknown.
- First response of the patient: called for local ambulance service, went to a local general practitioner or presented directly to the hospital emergency.

Te data was analyzed using SPSS 19 and the results were described in term of descriptive statistics.

Results

Amongst the total of 300 patients, 234 (78%) were males and 66 (22%) were females. Age ranged between 31 – 66 years. Two hundred four (68%) had no previous cardiac history, 24 (8%) had suffered from angina alone and 72 (24%) had been diagnosed to have had MI previously. One hundred fifty six (52%) were hypertensive, 72 (24%) were diabetic, while 66 (22%) had both hypertension and diabetes mellitus. Twenty four 8%) had previously suffered from a cerebrovascular accident, 12 (4%) were having hyperlipidemia and 6 (2%) had an underlying vasculitic disorder.

One hundred seventy four (58%) demonstrated delayed decision time, while 120 (40%) had delayed response time; only 6 (2%) presented within ½ hour of chest pain.

Table 1: Reasons for delay in presentation.

	Duration of Delay				
	Less than 1 hr	1 – 3 hrs	3 – 6 hrs	6 – 9 hrs	> 9 hrs
Thought it was not serious	35	5	45	105	20
Tried self-treatment at home first	7	5	30	0	0
Waited for a second lay opinion	4	0	0	15	5
Fear of the unknown	3	0	5	5	5
Others	0	0	0	0	0

Table 2: Influence of gender on duration of pre-hospital delay.

Gender		Duration of Delay				
		Less than 1 hr	1 – 3 hrs	3 – 6 hrs	6 – 9 hrs	> 9 hrs
Gender	Male	44	10	55	110	15
	Female	11	0	25	15	15
	Total	55	10	80	125	30

Table 3: Impact of previous cardiac history on duration of prehospital delay.

	Duration of Delay					
	Less than 1 hr	1 – 3 hrs	3 – 6 hrs	6 – 9 hrs	> 9 hrs	Total
Delayed decision time	29	5	45	80	15	174
Delayed response time	20	5	35	45	15	120

Table 4: Delay in presentation in relation to the nature of the first medical help.

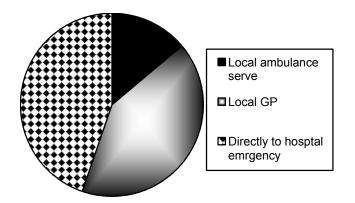|		First Medical Contact			
		Local Ambulance Service	Local GP	Directly to Hospital Emergency	Total
Type of delay	Delayed decision time	24	72	78	174
	Delayed response time	36	36	48	120

Chart 1: The first medical contact.

The commonest reason for patient's delay in presentation (70%) was that they thought it was not serious and would settle on its own as seen in Table 1. Maximum number of those having chest pain (44%) presented directly to the hospital emergency on their own, rather than calling rescue ambulance service or visiting a general practitioner (Chart 1).

Discussion

Early administration of a thrombolytic agent reduces infarct size and improves survival. Administration within one hour of onset of symptoms can reduce mortality by 50% and by 23% if given within 3 hrs.[3]

Most prior studies have found that older individuals are more likely to experience prolonged delay in seeking medical care in the setting of AMI than younger persons.[4-7] However, several studies have found that there were no age differences in medical care seeking behavior in patients hospitalized with AMI.[8-11] In our study, age was not found to influence the decision time.

Several studies have found that women are more likely to experience longer delays compared with men,[5-7,9–10] whereas others have suggested that there are no sex differences in duration of pre-hospital delay.[4,11] Our study demonstrated that though female patients were less than male in total, but on the whole most female presented with longer delay than males(Table 2).

It has been demonstrated by Alonzo that individuals who have experienced a previous cardiac event (such as an AMI) take longer to seek care for ischemic symptoms when compared to individuals who have not had a previous cardiac event.[12] El-Masri and Fox – Wasylyshyn found contradictory results in a series of five logistic regression models. Two of the models identified history of AMI as a risk factor for prolonged delay while one model identified an inverse relationship between history of AMI and delay.[13] We found in our study that those with no significant previous cardiac history took longer time in decision to seek medical care as compared to those who had had an MI in the past (see Table 3).

We also observed that more than half of the patients delayed presentation due to longer time taken in deciding to seek medical help rather than the time taken for arrival at the hospital. Out of those with delayed decision time, most (41%) went to the local general practitioner rather than presenting directly to the hospital or seeking help from local ambulance services (see Table 4). This is similar to the behavior seen in some other studies, which proved that since thrombolytic therapy is only available at hospitals, involvement of a general practitioner is known to increase prehospital delay further.[14]

Recognizing that symptoms are cardiac in origin is a crucial factor in the delay from the onset of coronary symptoms to call for medical care.[15] More than two – thirds of patients in our study group attributed their symptoms either to indigestion or to another non-cardiac cause. Denial is thought to be a common response to coronary symptoms.[16] Patients and family members should be told to expect denial and understand that it is a usual but inappropriate response to coronary symptoms and a significant factor responsible for delay in therapy.

Conclusion

Factors associated with duration of pre-hospital delay including patient's demographic, past medical history, clinical presentation, recognition of symptoms, and the first contact approached for help have been shown to affect medical care seeking behavior. The role of these and additional factors that may affect acute care – seeking behavior must be more systematically examined in future studies. Further research is needed to address such delays in particularly vulnerable groups.

References

1. Newby LK, Rutsch WR, Califf RM, Simoons ML, Aylward PE, Armstrong PW, et al. Time from symptom onset to treatment and outcomes after thrombolytic therapy: GUSTO-1 Investigators. J Am Coll Cardiol 1996; 27: 1646 –1655.

2. Heriot AG, Brecker SJ, Coltart DJ. Delay in presentation after myocardial infarction. J R Soc Med 1993 November; 86 (11): 642–644.

3. Moser, D. K., Kimble, L. P., Alberts, M. J., Alonzo, A., Croft, J. B., Dracup, K., et al. Reducing delay in seeking treatment by patients with acute coronary syndrome and stroke. J Cardiovascular Nursing 2007; 22 (4): 326-343.

4. Goldberg RJ, Yarzebski J, Lessard D, Gore JM. Decade – long trends and factors associated with time to hospital presentation in patients with acute myocardial infarction: the Worcester Heart Attack study. Arch Intern Med 2000; 160: 3217–3223.

5. Goldberg RJ, Gurwitz JH, Gore JM. Duration of, and temporal trends (1994 – 1997) in, pre-hospital delay in patients with acute myocardial infarction: the second National Registry of Myocardial Infarction. Arch Intern Med 1999; 159: 2141–2147.

6. McGinn AP, Rosamond WD, Goff DC Jr, Taylor HA, Miles JS, Chambless L. Trends in prehospital delay time and use of emergency medical services for acute myocardial infarction: experience in 4 US communities from 1987 – 2000. Am Heart J 2005; 150: 392–400.

7. Sawaya JI, Jazra C, Eid EV, Sabra RF. Gender differences in the diagnosis and treatment of acute myocardial infarction in Lebanon. J Med Liban 1999; 47: 2–6.

8. Banks AD, Dracup K. Factors associated with prolonged pre-hospital delay of African Americans with acute myocardial infarction. Am J Crit Care 2006; 15: 149–157.

9. Banks AD, Dracup K. Are there gender differences in the reasons why African Americans delay in seeking medical help for symptoms of an acute myocardial infarction? Ethn Dis 2007; 17: 221–227.

10. Moser DK, McKinley S, Dracup K, Chung ML. Gender differences in reasons patients delay in seeking treatment for acute myocardial infarction symptoms. Patient Educ Couns 2005; 56: 45–54.

11. McKinley S, Moser DK, Dracup K. Treatment-seeking behavior for acute myocardial infarction symptoms in North America and Australia. Heart Lung 2000; 29: 237–247.

12. Alonzo, A.A. Acute myocardial infarction and posttraumatic stress disorder: the consequences of cumulative adversity. J Cardiovascular Nursing 1999; 13 (3): 33-45.

13. El-Masri, M.M. and Fox – Wasylyshyn, S.M. Methodological issues associated with using different cut – off

points to categorize outcome variables. Can J Nursing Research 2006; *38* (4): 163-172.

14. Gray D, Keating NA, Murdock J, et al. Impact of hospital thrombolysis policy on out – of – hospital response to suspected myocardial infarction. Lancet 1993; 341: 654-7.

15. Ruston A, Clayton J, Calnan M. Patients' actions during their cardiac event: qualitative study exploring differences and modifiable factors. BMJ 1998; 316: 1060–4.

16. Dracup K, Moser DK. Treatment – seeking behaviour among those with signs and symptoms of acute myocardial infarction. Heart Lung 1991; 20: 570–5.