ORIGINAL ARTICLE

Examine the Prevalence and Factors Associated to Delayed Arrival in Patients with Acute Myocardial Infarction

ARZ MUHAMMAD[1], MUHAMMAD TUFAIL[2], MUAZZAM FUAAD[3]
[1]Senior Registrar, [2]Assistant Professor, Department of Cardiology, ShaikhZayed Hospital, Lahore
[3]Assistant Professor, Department of Medicine, Doctor Trust Teaching Hospital/Rai Medical College, Sargodha
Correspondence to: Dr. Arz Muhammad E-mail: arz.muhammad@yahoo.com Cell: 0335-4400596

ABSTRACT

Aim: To determine the prevalence of delayed arrival of patients presented with acute myocardial infarction also examine the factors associated for late arrival to hospital.
Study design: Cross-sectional
Place & duration of study: Department of Cardiology, Shaikh Zayed Hospital, Lahore from 1st July 2109 to 30th June 2020.
Methods: One hundred and fifty patients of both genders with acute myocardial infarction were included. Patient's ages were ranging from 20 to 70 years. Patients detailed demographic age, sex, residence; education and socio-economic status were recorded. Frequency of delayed arrival was recorded. Factors associated with delayed arrival were examined.
Results: Ninety eight (65.33%) patients were males while 34.37% patients were females. Majority of patients 73(48.67%) were in the age group 35 to 50 years followed by 48(32%) patients with ages 51 to 65 years. The frequency of delayed arrival was 66.67% who arrived > 2 hours to the time from onset of symptoms. Most common factor for delayed arrival was use of public transport 50%, long distance more than 15km 40% and the absence of attendant 25%.
Conclusion: The prevalence of delayed arrival was high in patients with acute myocardial infarction. Use of public transport, long distance, low education and low socio-economic status were the most common factors associated with delayed arrival to hospital.
Keywords: Acute myocardial infarction, Delayed arrival, Risk factors

INTRODUCTION

The benefits of reperfusion therapy for patients with acute myocardial infarction (AMI) depend on timely patient presentation for acute care[1]. Prolonged time intervals have been associated with worse outcomesand are an international problem[2]. In the United States and other Western countries, the median time from symptoms onset to hospital arrival is 2–3 h [2 h for ST-elevated myocardial infarction (STEMI), 3 h for non ST-elevated myocardial infarction (NSTEMI)] yet approximately 10% of patients still arrive at the hospital greater than 12 h after noticing symptoms[3,4]. In countries with limited access to advanced health care, less developed emergency response systems, and limited personal and public financial resources for health care, time intervals to hospital arrival are reportedly worse[5,6].

In addition, the "time dependent" impact of fibrinolytic therapy has been demonstrated consistently and provides incontrovertible support for increased patient survival, decreased infarct size, and improved left ventricular performance with early successful reperfusion[7]. Moreover reperfusion strategies in AMI are time dependent and are most beneficial if applied within two hours from the onset of symptoms[8]. Institution of definitive treatment for AMI should begin within1 hour of symptom onset. Survival rates are improved by up to 50% if reperfusion is achieved within 1 hour of symptom onset and by 23% if it is achieved within 3 hours of symptom onset. In one trial, delaying treatment by 30 minutes reduced average life expectancy by 1 year. However, in many countries pre-hospital delay on the part of the patient remains a substantial problem with almost half presenting more than 4 hours after symptom onset[9,10].

The present study was conducted aimed to examine frequency of late arrival and associated factors of late arrival in patients with acute myocardial infarction.

Received on 11-11-2020
Accepted on 13-02-2021

MATERIALS AND METHODS

This study was conducted at Department of Cardiology, Shaikh Zayed Hospital, Lahore from 1st July 2109 to 30th June 2020.One hundred and fifty patients of both genders with acute myocardial infarction were included. Patient's ages were ranging from 20 to 70 years. Patients detailed demographic age, sex, residence; education and income status were recorded after taking informed written consent. Patients with history of myocardial infarction, coronary artery bypass surgery and those with no consent were excluded from the study.Frequency of delayed arrival to hospital after onset of symptoms was recorded. Patients arrived at hospital after 2 hours were considered as delayed arrival. Factors responsible for late arrival such as use of transport, distance, education, income, absence of attendant etc were examined.All the data was analyzed by SPSS 20.

RESULTS

There were 98(65.33%) male patients and 52(34.37%) female patients. Forty eight (32%) were in the age group 36 to 50 years, 72(48%) patients with ages 51 to 65 years, 24(16%) patients were ages above 65 years and 6(4%) patients had ages 20 to 35 years. 85 (56.66%) patients had

rural residency while 43.33% patients had urban residency. 80 (53.33%) patients had low income less than PKR 30000 while 70 (46.67%) patients had middle income 30000 to 50000 PKR. Ninety five (63.33%) patients were illiterate while 55 (36.67%) patients were literate. Average time from onset of symptoms and 8.45±5.88 hours to time taken to arrival was 7.28±6.15 hours (Table 1).

Eighty two (54.67%) patients had anterior wall myocardial infarction, 56 (37.33%) patients had inferior wall MI, 8 (5.33%) patients had posterior wall MI and 4(2.67%) had lateral wall MI (Table 2). Out of 150 patients 100 (66.67%) patients were reached hospital after 2 hour (range 3-24 hrs) while 50 patients (33.33%) had arrival at hospital within 2 hours (range 20 min to 110 min) (Table 3).

Table 1: Demographic information of the patients

Variable	**No.**	**%**
Time taken to arrive (hrs)	7.28±6.15	
Onset of symptoms (Time)	8.45±5.88	
Gender		
Male	98	65.33
Female	52	34.67
Age (years)		
20 – 35	6	4.0
36 – 50	48	32.0
51 – 65	72	48.0
> 65	24	16.0
Residence		
Rural	85	56.66
Urban	65	43.33
Income (Rs)		
<30000	80	53.33
>30000	70	46.67
Education		
Literate	55	36.67
Illiterate	95	63.33

Table 2: Types of MI (n=150)

Types	**No.**	**%**
Anterior	82	54.67
Inferior	56	37.33
Posterior	8	5.33
Lateral	2	2.67

Table 3: Frequency of delayed arrival among all the patients

Arrival time (hours)	**No.**	**%**
>2	100	66.6
<2	50	33.4

Table 4: Factors associated to delayed arrival

Variable	**Delayed (n=100)**	**Not delayed (n=50)**	**P value**
Income <30000	65 (65%)	15 (30%)	0.038
Illiterate	70 (70%)	25 (50%)	0.048
Vehicle use			
Public transport	50 (50%)	8 (16%)	0.025
Ambulance	30 (30%)	25 (50%)	0.39
Own vehicle	20 (20%)	17 (34%)	0.15
Distance (km)			
>20	67 (67%)	15 (30%)	0.03
<20	33 (33%)	35 (70%)	0.036
Attendant absence			
Yes	40 (40%)	3 (6%)	0.003
No	60 (60%)	47 (94%)	0.05

In comparison 65 (65%) patients with delayed arrival had low income <30000 while patients who were not delayed 15 (30%) patients had low income <30000. 70% patients in delayed arrival group were illiterate while 25 (50%) patients were illiterate in not delayed group. 50% patients use public transport, 30% use ambulance and 20% use own vehicle in delayed arrival group while in not delayed group 16% patients use public transport, 50% use ambulance and 34% use own vehicle. In delayed arrival group 67% patients had distance >20 km while 33% patients had distance < 20 km. In not delayed patients 70% patients had distance <20 km while 30% had distance >20 km. in delay arrival patients 40% patients had absence of attendant/companion at onset of symptoms (Table 4).

DISCUSSION

ST elevation myocardial infarction is one of the leading causes of mortality and morbidity in all over the world and late arrival from onset of symptoms to hospital is the major cause of increasing morbidity and mortality rate in acute myocardial patients.[11] Present study was conducted aimed to examine the frequency and risk factors of delayed arrival in STEMI patients. In this study total 150 patients of acute myocardial infarction were included. Majority of patients 65.33% were males as compared to females 34.67% and majority of patients were ages 36 to 65 years. These results were similar to some previous studies in which male patients were high in numbers 60 to 80% as compared to females.[12,13] In our study 56.67% patients had rural residence and majority of patients had income less than PKR 30000. 63.33% patients were illiterate. These results were comparable to some previous studies[14,15].

This study showed that 100(66.67%) patients were reached hospital after 2 hour (range 3-24 hrs) while 50 patients (33.33%) had arrival at hospital within 2 hours (range 20 min to 110 min). A study conducted by Ismail et al[16] reported frequency of delayed arrival was 71% who reached hospital after 1 hours of onset of symptoms.

In present study we found in comparison between delay arrival patients and not delayed most of patients 65% patients had income less than PKR 30000 as compared to patients who were not delayed 30% p=0.038. Illiteracy was the common factor of delayed arrival found in 70% patients. These results were similar to some previous studies in which low income and illiteracy were the important factor of delayed arrival[17,18].

In our study we found that use of public transport was the most important risk factor for delayed arrival and found in 50% as compared to patient who were not delayed 16% p=0.025. Patient's long distance above 20km was also the important factor involved in delayed arrival. Attendant absence was also considered an important risk factor for delayed arrival and we found in 40% patients as compared to 6% who were not delayed. These results were similar to many other studies in which long distance above 10 km, illiteracy, use of public transport and absence of companion from the onset of symptoms were the most common risk factors for delayed arrival at hospital[19,20].

CONCLUSION

Acute myocardial infarction is one of the most common life threatening disorders. Early and proper treatment may helps to reduce the morbidity and mortality. In this study we concluded that prevalence of delayed arrival was high in patients with acute myocardial infarction. Use of public transport, long distance, low education, low socio-economic status and absence of companion at the time to onset of symptoms were the most common factors associated with delayed arrival to hospital.

REFERENCES

1. WangX,Liu Y,Liu XF.Investigating the factors of affecting the treatment delay of AMI patients.NursPract Res 2012; 9;8-10.
2. McDonnell LA, Pipe AL, Westcott C, Perron S, Lewis DY, Elias N, et al.Perceived vs actual knowledge and risk of heart disease in women: findings from a Canadian survey on heart health awareness, attitudes, and lifestyle, CanJCardiol 2014; 30(7): 827–34.
3. Abed MA, Eshah NF, Moser DK. Risk profile of myocardial infarction in young versus older adults. Heart Lung 2018; 47(3): 226–30.
4. Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, et al. Executive summary: heart disease and stroke statistics-2016 update: a report from the American Heart Association. Circulation 2016; 133(4): 447–54.
5. Khesroh A, Al-Roumi F, Al-Zakwani I, Attur S, Rashed W, Zubaid M. Gender differences among patients with acute coronary syndrome in the Middle East. Heart Views 2017; 18(3): 77–82.
6. Greenberg MR, Miller AC, Mackenzie RS, Richardson DM, Ahnert AM, Sclafani MJ, et al. Analysis of sex differences in preadmission management of ST-segment elevation (STEMI) myocardial infarction. Gend Med 2012; 9(5): 329-34.
7. Davis LL, Mishel M, Moser DK, Esposito N, Lynn MR, Schwartz TA. Thoughts and behaviors of women with symptoms of acute coronary syndrome. Heart Lung 2013; 42(6): 428-35.
8. Nguyen HL, Gore JM, Saczynski JS, Goldberg RJ. Age and sex differences and twenty-year trends (1986–2005), in pre-hospital delay in patients hospitalized with acute myocardial infarction. Circulation 2011; 3(6): 590-98.
9. Aziz F. Coronary artery disease in women: an unsolved dilemma. J Clin Med Res 2014; 6(2): 86-90.
10. Rokalaki H, Giakoumidakis K, FotosNV, Galanis P, Patelarou E, Siamaga E, Elefsiniotis IS. Factors associated with delayed hospital arrival among patients with acute myocardial infarction: a cross-sectional study in Greece. Int Nursing Rev 2011; 58: 470-6.
11. Amsterdam EA, Wenger NK, Brindis RG, Casey DE Jr, Ganiats TG, Holmes DR Jr, et al. AHA/ACC guideline for the management of patients with non-ST-elevation acute coronary syndromes: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines.*Circulation*2014; 130 (25):e344-426.
12. Roffi M, Patrono C, Collet JP, Mueller C, Valgimigli M, Andreotti F, et al. 2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation: Task Force for the Management of Acute Coronary Syndromes in Patients Presenting without Persistent ST-Segment Elevation of the European Society of Cardiology (ESC). Eur Heart J 2016; 37(3):267-315.
13. Mujtaba SF, Sohail H, Ram J, Waqas M, Hassan M, Sial JA, et al. Pre-hospital delay and its reasons in patients with acute myocardial infarction presenting to a primary percutaneous coronary intervention-capable center. Cureus2021; 13(1): e12964.
14. Khan A, Phadke M, Lokhandwala YY, Nathani PJ: A study of prehospital delay patterns in acute myocardial infarction in an urban tertiary care institute in Mumbai. J Assoc Physicians India 2017, 65:24-7.
15. Rafi A, Sayeed Z, Sultana P, Aik S, Hossain G: Pre-hospital delay in patients with myocardial infarction: an observational study in a tertiary care hospital of northern Bangladesh. BMC Health Serv Res 2020, 20:633.
16. Ismail M, Bhatti KI, Ashraf T Frequency and factors responsible for delayed arrival of myocardial infarction (STEMI) patients to hospital. Pak Heart J 2017; 50(03): 184-9.
17. Pitsavos C, Kourlaba G, Panagiotakos DB, Stefanadis C. Factors associated with delay in seeking health care for hospitalized patients with acute coronary syndromes: the GREECS study. Hellenic J Cardiol 2006; 47:329-36.
18. Choudhary R, Sharma SM, Kumar V, Gautam DK. An observational study of prehospital and hospital delay in reperfusion for acute myocardial infarction at a university hospital in India. J PractCardiovascSci 2016;2(3):163-8.
19. Gartner C, Walz L, Bauernschmitt E, Ladwig KH. The causes of Prehospital Delay in Myocardial Infarction. DtschArztebllInt 2008; 105:28
20. Mohan B, Bansal R, Dogra N, Sharma S, Chopra A, Varma S, et al.: Factors influencing pre-hospital delay in patients presenting with ST-elevation myocardial infarction and the impact of pre-hospital electrocardiogram. Indian Heart J 2018; 70:194-8.