Original Article

ST Elevation MI

Frequency of Acute ST Elevation Myocardial Infarction and Various Reasons of Pre-Hospital Delay in Early Morning Hours

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ABSTRACT

Objective: To determine the frequency of acute ST elevation myocardial infarction and various reasons of pre-hospital delay in early morning hours

Study Design: Cross-sectional survey

Place and Duration of Study: This study was conducted in the department of Cardiology, Chaudhary Pervaiz Elahi Institute of Cardiology, Multan from 18th September 2012 to 17th March 2013.

Materials and Methods: 164 patients of either sex giving mid-section torment in right on time morning were incorporated in this study. The meeting secured the patients' indications, the season of onset of side effects, the consequent occasions and the past history. Entry time short the season of side effects onset was ascertained as pre-healing center postponement and it was computed in hours.

Results: 164 patients were included in the study. The mean age of patients was 54.85 years with standard deviation of 10.684 years. 77 (46.95%) patients were male and 87 (53.05%) patients were female. Mean delay of patients with chest pain was 3.49 hours with standard deviation of 1.777 hours. 96 patients had pre-hospital delay of more than 3 hours while 68 patients had no pre-hospital delay. 130 patients presenting with morning chest pain had ST elevation MI while 34 patients did not have ST elevation MI.

Conclusion: In conclusion, onset of symptoms at night especially in morning causes more prolonged delay in hospital arrival because transport means and medical helps are beyond reach at these times.

Key Words: Acute ST elevation myocardial infarction, early morning hours, pre-hospital delay, various reasons

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INTRODUCTION

Despite late consoling reductions in the demise rate, serious myocardial dead tissue (MI) is the fundamental wellspring of death worldwide.[1] The mortality associated with MI has been falling in the western world consistently as a delayed consequence of better healthcare[2] yet is depended upon to rise in the making world.[3] It is in the blink of an eye by and large saw that ischemic scenes in the midst of each day activities tend to take after a circadian appointment, with a crucial peak in the morning. Circadian rhythms are characteristic rhythms that happen endogenously in most regular organisms.[4]

In one study repeat of exceptional ST stature myocardial confined rot (STEMI) in front of calendar morning hours was 74%.[5] This recognition exhibits that the onset of these cardiovascular events is not discretionary, and gives a clue to segment. An atherosclerotic plaque is displayed to systemic physiologic processes[6] that could enhance the likelihood of plaque break and thrombosis in the region of a frail plaque. Countless methods increase in force in the morning, including plasma catecholamine levels, mindful development, heart rate, circulatory strain, vascular tone, platelet aggregability and blood consistency increase, while some guarded variables, for instance, vagal activity and fibrinolytic activity are decreased.[7,8]

The backbone of treatment for intense STEMI is reperfusion treatment. An imperative variable in administration of intense MI is its auspicious administration.[9] Most of the deaths because of intense MI happen out of the healing center before admission.[10] The "way to-inflatable" time, that is, time taken from the section into the clinic to PCI ought to be under 90 minutes.[11] The "way to-needle" time, that is, time taken from passage into the doctor's facility office to beginning of thrombolytic treatment ought to be under

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30 minutes.[12] The treatment stays of advantage up to 12 hours particularly if Q waves have not been formed.[13]

MATERIALS AND METHODS

It was a cross-sectional study, conducted on patients admitted through emergency department of Chaudary Pervaiz Elahi Institute of Cardiology, Multan. Non probability purposive sampling technique was used. Patients of both genders, age between 20-80 years with intense average mid-section torment displaying in crisis branch of CPEIC in ahead of schedule morning hours and myocardial localized necrosis were incorporated.

Patients with intense Non-ST rise myocardial localized necrosis, past history of ST height myocardial dead tissue, left package branch square, past history of valvular coronary illness and diabetes mellitus were avoided.

After endorsement from neighborhood moral advisory group, patients coming in CPEIC crisis satisfying the consideration criteria were chosen. After educated assent patients or orderlies were met by preset poll. The meeting secured the patients' indications, the season of onset of side effects, the ensuing occasions and the past history. The mid-section agony was arranged into mellow, direct and serious as per VAS score. Landing time short the season of indications onset was ascertained as pre-healing facility deferral and it was computed in hours.

All the information was entered and investigated utilizing PC program SPSS adaptation 10.0. Clear measurements were utilized to figure mean and standard deviation for age of the patients and pre-doctor's facility delays. Frequencies and rates was ascertained for sex and time of intense ST height myocardial localized necrosis in ahead of schedule morning hours and different reasons as expressed in operational definition. Effect modifier was controlled through stratification of age and gender to see the effect of these on outcome variables applying chi-square test taking $p \leq 0.05$ as significant.

RESULTS

A total of 164 patients were included in the study. The mean age of patients was 54.85 years with standard deviation of 10.684 years, median age of patients was 57.00 years, minimum age of patients was 28 years, maximum age of patients was 78 years and range of age of patients was 50 years as shown in table no: 1. Out of 164 patients, 77 (46.95%) were male and 87 (53.05%) patients were female as shown in figure no: 1.

Mean delay of patients with chest pain was 3.49 hours with standard deviation of 1.777 hours, minimum delay was 1 hour, maximum delay was 8 hours and range of delay was 7 hours as shown in table no: 2

Mean delay in male was 3.58 with standard deviation of 1.915 hours and in female the mean delay were 3.40 with standard deviation of 1.653 hours.

130 patients presenting with morning chest pain had ST elevation MI while 34 patients did not have ST elevation MI.

Table No. 1: Age of patients in years

Total no of cases	Valid	**164**
	Missing	**0**
Mean age of patients in years		**54.85**
Median age of patents in years		**57.00**
Mode		**58**
Std. Deviation		**10.684**
Range		**50**
Minimum age of patients in years		**28**
Maximum age of patients in years		**78**

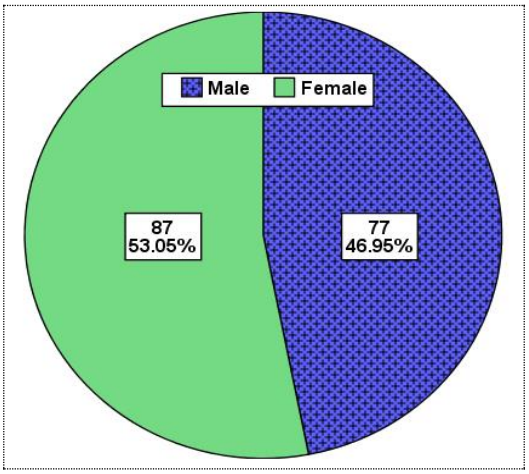

Figure No: 1: Gender of patients

Table No. 2: Mean delay in hours

Total no of patients (n)	**Valid**	**164**
	Missing	**0**
Mean delay in hours		**3.49**
Median delay in hours		**3.00**
Mode		**2**
Std. Deviation		**1.777**
Variance		**3.159**
Range of delay in hours		**7**
Minimum delay in hours		**1**
Maximum delay in hours		**8**

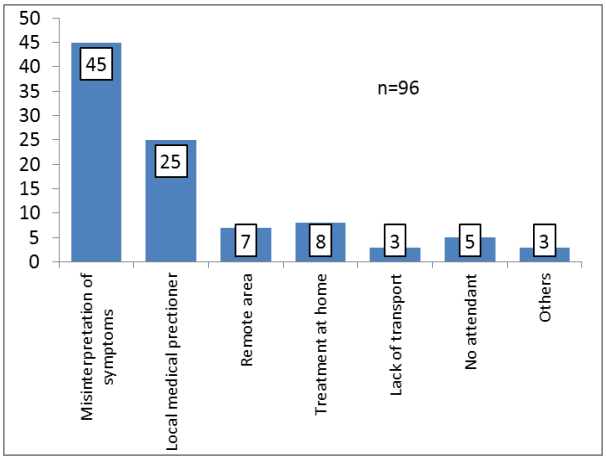

Figure No.2: Frequency of various reasons of pre-hospital delay

Table No: 3: Pre-hospital delay (>3 hours) in different gender of patients

Gender of patients	Pre-hospital delay		Total	P-value
	Yes	No		
Male	52 67.5%	25 32.5%	77 100%	0.028
Female	44 50.6%	43 49.4%	87 100%	
Total	96 58.5%	68 41.5%	164 100%	

Table No. 4: Pre-hospital delay (>3 hours) in different age group of patients

Age group of patients	Pre-hospital delay		Total	p-value
	Yes	No		
20-40 years of age	**7 38.9%**	**11 61.1%**	**18 100%**	**0.195**
41-60 years of age	**56 60.2%**	**37 39.8%**	**93 100%**	
61-80 years of age	**33 62.3%**	**20 37.7%**	**53 100%**	
Total	**96 58.5%**	**68 41.5%**	**164 100%**	

In the frequency of pre-hospital delay, 96 patients had pre-hospital delay of more than 3 hours while 68 patients had no pre-hospital delay.

52 male patients and 44 female patients had pre-hospital delay while 25 male patients and 43 female patients had no pre-hospital delay with significant p value of 0.028 as shown in table no: 3

7 patients in 20-40 years of age group, 56 patients in 41-60 years of age group and 33 patients in 61-80 years of age group had pre-hospital delay while11 patients in 20-40 years of age group, 37 patients in 41-60 years of age group and 20 patients in 61-80 years of age group had no pre-hospital delay with insignificant p value of 0.195 as shown in table no: 4.

In 96 patients with pre-hospital delay, 45 patients had misinterpretations of symptoms, 25 patients went to local medical practitioner, 7 patients were from remote area, 8 patients got treatment at home, 3 patients had lack of transport, 5 patients had no attendant while 3 patients had other causes as shown in figure no: 2.

61 male patients and 69 female patients had ST elevation MI while 16 male patients and 18 female patients had no ST elevation MI with insignificant p value of 0.989.

DISCUSSION

The pre-doctor's facility deferral stays one of the primary driver of the decreased advantage of reperfusion treatment for the patients with an intense myocardial dead tissue (AMI). In this manner a few studies have explored how AMI patients think and act amid side effect presentation. Onset of indications during the evening yields more drawn out deferral in healing center landing on the grounds that vehicle means and restorative aides are far-off at these times.[14]

Variables connected with pre-doctor's facility deferral were age > or = 65 years, retirement or unemployment, history of myocardial dead tissue, side effect onset at home and irregular side effects, while vicinity of onlookers, for example, companions, associates or even outsiders, deplorable side effects, dyspnea, sweating, syncope and attribution of indications to heart cause were identified with right on time presentation to the hospital.[15]

The mean postponement in our study was 3.49 hours with standard deviation of 1.777 hours. 96 (58.54%) patients touched base at healing facility with deferrals of over 3 hours when maximal impact of reperfusion had passed. In outside studies mean pre-healing facility deferral shifts from 1.6 to 42.4 hours.[16]

Ank[17] in his study uncovered that the mean aggregate postponement time for the patients with an intense myocardial localized necrosis was 17.42 (+/ - 24.03) hours. This finding is clarified by the actualities that there are intricate variables connected with this finding. In another study directed by Alidoosti M[18] demonstrated that the mean pre-doctor's facility postponement time in patients with intense myocardial localized necrosis in morning was 7.6±9.1 hours. Elderly persons, likely because of individual non-adequacy, would defer in achieving restorative care.[19]

Dracup et al[20] reported that just 14% of the patients touched base inside of one hour of the onset of side effects, 28.5% inside of two hours and 41% inside of four hours. Then again, 54% landed at the clinic over six hours after first encountering cardiovascular

indications. Ying et al[21] uncovered that just 34% of the patients looked for medicinal consideration inside of one hour and a further 36% of the patients displayed to one of the eight doctor's facilities inside of two hours after the onset.

A study done by Sari et al[22] who expressed that from 439 patients with AMI, 80% patients were male and 20% patients were female. As per Ying et al who concentrated on 102 patients with AMI, 78 (76.5%) were male patients and 24 (23.5%) were female patients.

Our study uncovered that the male who suspected intense myocardial dead tissue were more probable than female to postpone time. Factually, there were a huge contrast in the middle of men and ladies in pre-doctor's facility deferral time. This finding is bolstered by Blohm et al[23] who uncovered that in the pre-doctor's facility defer, the free indicator of a drawn out deferral in patients with AMI was the male sex.

As per their age, the aftereffects of our study report that the mean period of patients with AMI was 54.85 and SD 10.684. This is upheld by Norgaz et al[24] who expressed that the mean age was 56.7±11.6 years with ST-height AMI.

Ting et al[25] uncovered that the age of the more established patients with AMI was connected with longer defers in looking for treatment. Johansson et al26 demonstrated that the most continuous explanation behind not picking a rescue vehicle was that patients did not see the side effects to be not sufficiently kidding to legitimacy an extreme activity like calling the crisis number (43%).

The second most regular purpose behind not picking a rescue vehicle was that the patients did not consider Emergency Medical administration being a choice (38%). While, (26%) thought it was pointless to call an emergency vehicle.

In our study, the middle postponement time was fundamentally more in patients who at first exhibited to a neighboring facility/nearby healing center, contrasted with the individuals who straightforwardly introduced to a clinic completely furnished with consistent heart care. The present's consequences study may legitimize the requirement for straightforwardly exchanging patients with the signs and side effects of AMI to a healing facility outfitted with coronary consideration unit, catheterization research facility, as opposed to a neighboring center/nearby clinic. Beginning presentation to a neighboring facility/nearby doctor's facility may prompt underutilization of reperfusion methods, bringing about expanded horribleness and mortality.[27]

A few studies reported that solitary, separated, or dowager patients showed longer pre-doctor's facility delays.[28] However, conjugal status was not connected with pre-healing facility delay in our study.

The quantity of kids, restriction of AMI, and day of presentation (weekday versus weekend) were not connected with pre-healing facility delay. In another study led by Banks AD et al[29] demonstrated that Single, widowed, or separated patients had longer postpone times than did wedded patients (5.33 versus 2.50 hours), and patients with diabetes deferred longer than did those without diabetes (7.29 versus 3.50 hours).

In our study, patients who thought their signs or indications were not kidding; on the other hand, their reaction time was longer than that of the patients who thought their signs or side effects were not genuine. These outcomes are as opposed to those of Dracup and Moser[30] who found that crediting signs and manifestations to the heart and assessing signs and side effects as genuine were indicators for shorter postponement times. On the other hand, in our concentrate, despite the fact that a large portion of the patients in the specimen saw their signs and side effects as genuine, their middle postponement time was longer than that of patients who saw their signs and indications as not genuine.

In light of the present's consequences think about, the analyst prescribes that the instruction projects ought to be created and executed by focusing on the general group particularly the patients with coronary supply route maladies. It ought to be centered around the AMI manifestations, the significance of ahead of schedule presentation and to decrease pre-doctor's facility delay. Future exploration is fundamental on the off chance that we are to see more about which particular elements foresee the individual segments of postponement in order to target intercessions viably furthermore give the method for ahead of schedule analysis and treatment.

CONCLUSION

In conclusion, onset of symptoms at night especially in morning causes more prolonged delay in hospital arrival because transport means and medical helps are beyond reach at these times. Furthermore it is important to inform the general population, especially high risk persons about manifestations of myocardial ischemia and a need to prompt hospital referral by means of ambulance in case confronting these symptoms. Public campaign and medical care providers have substantial role in this regard.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Omar MI, Shakil A. The silent killer. J Coll Physicians Surg Pak 2005;15:749-50.
2. Barchielli A, Balzi D, Pasqua A, Buiatti E. Incidence of acute myocardial infarction in Tuscany, 1997-2002: data from the Acute Myocardial Infarction Registry of Tuscany (Tosc-AMI). Epidemiol Prev 2006;30:161-8.
3. Goswami B, Rajappa M, Singh B, Ray PC. Inflammation and dyslipidaemia: a possible interplay between established risk factors in North Indian males with coronary artery disease. Cardiovasc J Afr 2010;21:103-8.

4. Tanaka A, Kawarabayashi T, Fukuda D, Nishibori Y, Sakamoto T, Nishida Y. Circadian variation of plaque rupture in acute myocardial infarction. Am J Cardiol 2004;93:1–5.
5. Khan MS, Ahmad SI. Circadian Variation - Increased Morning Incidence of Acute Myocardial Infarction in Patients with Coronary Artery Disease. J Pak Med Assoc 2003;53:84-7.
6. LaBounty T, Eagle KA, Manfredini R, Fang J, Tsai T, Smith D. The impact of time and day on the presentation of acute coronary syndromes. Clin Cardiol 2006;29:542–6.
7. Haus E. Chronobiology of hemostasis and inferences for the chronotherapy of coagulation disorders and thrombosis prevention. Adv Drug Deliv Rev 2007;59:966–84.
8. Touitou Y, Bogdan A. Circadian and seasonal variations of physiological and biochemical determinants of acute myocardial infarction. Biol Rhythm Res 2007;38:169–79.
9. Boden WE, Eagle K, Granger CB. Reperfusion strategies in acute ST-segment elevation myocardial infarction: a comprehensive review of contemporary management options. J Am Coll Cardiol 2007;50:917-29.
10. Barbagelata A, Perna ER, Clemmensen P, Uretsky BF. Time to reperfusion in acute myocardial infarction. It is time to reduce it! J Electrocardiol 2007;40:257-64.
11. Flynn A, Moscucci M, Share D, Smith D, Lalonde T. Trends in Door-to-Balloon Time and Mortality in Patients With ST-Elevation Myocardial Infarction Undergoing Primary Percutaneous Coronary Intervention. Arch Intern Med 2010; 170:1842-9.
12. Menon V, Harrington RA, Hochman JS, Cannon CP. Thrombolysis and adjunctive therapy in acute myocardial infarction: the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. Chest 2004;126:549-75.
13. Antman EM, Braunwald E. ST-segment elevation myocardial infarction. In: Kasper DL, Fauci AS, Longo DL, Braunwald E, Hauser SL, Jameson JL, editors. Harrison's principles of internal medicine. 16th ed. 2005.p.1448-58.
14. Smalhotra, Gupta M, Chadra KK, Grover A, pandhi P. Prehospital delay inpatients hospitalized with acute myocardial infarction in the Emergency unit of a North Indian tertiary care hospital. Ind Heart J 2003;55:349-53.
15. Krishnaswamy A, Lincoff AM, Menon V. Magnitude and consequences of missing the acute infarct-related circumflex artery. Am Heart J. 2009;158:706–12.
16. Yarzebski J, Goldberg RJ, Gore JM, Alpert JS. Temporal trends and factors associated with extent of delay to hospital arrival in patients with acute myocardial infarction: the Worcester Heart Attack Study. Am Heart J 1994;128(2):255-63.
17. Ank. Prehospital delay in treatment after acute myocardial infarction. J Korean Acad Nurs. 2001; 31(7):1141-50.
18. Alidoosti M. Determinants of prehospital delay in patients with acute myocardial infarction. Acta Medica Iranica 2004;42:50-4.
19. Zerwic JJ. Patients delay in seeking treatment for acute myocardial infarction symptoms. J Cardiovasc Nurs 1999;13(3):21-32.
20. Dracup K, McKinley S, Doering LV, Riegel B, Meischke H, Moser DK. Acute Coronary Syndrome: What Do Patients Know. Arch Intern Med 2008;168(10):1049– 54.
21. Ying W, Ying Z yu-Qiu L, Bao-Li H, cong-Xin H. Factors associated with the extent of care-seeking delay for patients with acute myocardial infarction in Beijing. Chin Med J 2004;117(12):1772-7.
22. Sari I, Acar Z, Ozer O, Erer B, Tekbaş E, Uçer E. Factors associated with prolonged prehospital delay in patients with acute myocardial infarction. Turk Kardiyoloji Dernegi Arsivi 2008;36(3): 156-62.
23. Blohm B, Karlsson H, Herlitz K. Factors associated with prehospital and in-hospital delay time in acute myocardial infarcon: a 6 years' experience. J Int Med 2008;243(3):243-50.
24. Norgaz T, Hobikoğlu G, Aksu H, Esen A, Gül M, Özer O. The relationship between prehospital delays of patients with ST-elevation acute myocardial infarction and clinical, demographic, and socioeconomic factors: importance of patient education. Türk Kardiyol Dern Arş 2005;33:392-7.
25. Ting H, Bradley E, Wang Y, Nallamothu B, Gersh B, Roger V. Delay in Presentation and Reperfusion Therapy in ST-Elevation Myocardial Infarction. Am J Med 2008;121(4):316–23.
26. Johansson I, Stromberg A, Swahn E. Factors related to delay times in patients with suspected acute myocardial infarction. Heart Lung 2004; 33(5):291-300.
27. Avorn J, Knight E, Ganz DA, Schneeweiss S. Therapeutic delay and reduced functional status six months after thrombolysis for acute myocardial infarction. Am J Cardiol 2004;94:415-20.
28. Banks AD, Dracup K. Factors associated with prolonged prehospital delay of African Americans with acute myocardial infarction. Am J Crit Care 2006;15:149-57.
29. Banks AD, Dracup K. Factors associated with prolonged prehospital delay of African Americans with acute myocardial infarction. Am J Crit Care 2006;15(2):149-57.
30. Dracup K, Moser DK. Beyond sociodemographics: factors influencing the decision to seek treatment for symptoms of acute myocardial infarction. Heart Lung 1997;26:253-62.