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FREQUENCY OF HIGH TIMI SCORE AND ITS SHORT TERM CLINICAL OUTCOMES

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Contribution

KI, MHD , SS and IK conceived the idea, designed the study, did data analysis and manuscript writing. UA and MH did review and final approval of manuscript. All authors contributed equally to the submitted manuscript.

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ABSTRACT

Objective: To determine the frequency of high thrombolysis in myocardial Infarction(TIMI) risk score and its short term clinical outcomes among patients presenting with acute ST elevation myocardial infraction.

Methodology: This cross sectional study was conducted at Cardiology Department, Lady Reading Hospital, Peshawar from 1st January till 31st December, 2012. This study included cases of ST elevation myocardial infarction (STEMI). Thrombolysis in Myocardial Infarction (TIMI) risk score was calculated for each case at the time of presentation. Patients were followed during their hospital stay and immediate post discharge days for the occurrence of complications like cardiogenic shock, arrhythmias, mortality etc.

Results: A total of 385 patients with acute myocardial infarction were included. Out of 385 patients, high TIMI score was found in 122 (31.84%). Out of 122 cases, males were 79(64.75 %). Mean age was 56.71 ± 10.00 years. Among 122 patients, 55(45.5%) had score of 9, 12(9.9%) had score of 10, 43(35.5%) had score of 11and 11(9.1%) had score of 12. Ventricular fibrillation was present in 21(17.4%), VT in 15(12.4%), atrial fibrillation 1(0.8%) and complete heart block in 8(6.61%). cardiogenic shock in 29(24.0%), pulmonary edema in 33(27.3%) and In-hospital death in 22(18.2%). Post infarct Angina in 39 (32.2%), stroke occurred in 11(9.1%) and 30(24.8%) underwent revascularization.

Conclusion: High TIMI risk score correlates significantly with death and complications like cardiogenic shock and arrhythmias in early post-infarction period. Frequency of complication increases with the increasing score.

Key Words: ST elevation myocardial infarction, Acute myocardial infarction, Ischemic heart disease, Thrombolysis in myocardial infarction risk score.

INTRODUCTION

ST elevation myocardial infarction (STEMI)is irreversible necrosis of heart muscle secondary to prolonged ischemia and is the leading cause of death worldwide.[1] The South Asian countries account for the highest burden of cardiovascular diseases including MI compared to any other region.[2] In Pakistan it is estimated that one in five middle-aged adults may have underlying coronary artery disease (CAD).[3] The risk of further cardiovascular complications, including recurrent MI, sudden cardiac death, heart failure, stroke and angina pectorisis substantial.

The most frequently used risk stratification system is thrombolysis in myocardial infarction (TIMI) risk score for STEMI patients.[4-6] The thrombolysis in myocardial infarction (TIMI) risk score for ST-segment elevation myocardial infarction (STEMI) is a simple score based on 8 high-risk parameters that can be used at the bedside for risk stratification of patients at presentation with STEMI, which was developed in a cohort of patients treated with fibrinolysis.[7,8] Even in patients with ST-elevation acute myocardial infarction (STEMI), for whom early therapeutic options are well defined, risk stratification has an impact on early and late therapeutic decision making.[9] TIMI Risk Score accurately defines the population of STEMI & PCI at high risk of death not only during the first 30 days but also the Mortality at 1 year was directly related to TIMI risk scores.[10,11]

Patients can be categorized into various strata depending on the scores, i.e. Low risk who have score of 4 or less, Moderate Risk have score of 5-8 and High risk group have score of.[9-14] Post MI complications in High Risk group occurred with increased frequency. This study was undertaken to determine the frequency of High Thrombolysis in Myocardial Infarction(TIMI) Risk Score and its Short Term clinical outcomes among patients presenting with acute ST Elevation Myocardial Infraction.

METHODOLOGY

This cross sectional study was conducted at Cardiology Department, Lady Reading Hospital, Peshawar from 1st January till 31st December, 2012. All patients of either gender, presenting with Acute STEMI who underwent thrombolysis were included . While patients having contraindication to Streptokinase therapy, having previous myocardial infarction, percutaneous coronary intervention, coronary artery bypass surgery, chronic renal failure or already diagnosed cases of arrhythmias were excluded from the study.

After approval from research and ethical committee and as per operational definition, all patients with acute ST elevation Myocardial infarction who presented to Cardiology Unit, Lady Reading Hospital, Peshawar were included in the study. The purpose of the study was explained to the patients. Informed written consent was taken from those who agreed to participate in the study. Demographic characteristics were recorded in the performa.

All patients were subjected to detailed history and clinical examination. All the patients were carefully evaluated for the calculation of TIMI score to detect high TIMI risk score.

Among those patients in whom High TIMI risk score had been calculated, were carefully followed up till 7th day to detect arrhythmias (VT, VF, AF and CHB), cardiogenic shock, cardiac pulmonary edema and in hospital death. All the patients were managed as per ward and cardiology protocols and all the initial diagnostic and follow up assessments was done under supervision of consultant cardiologist.

All the above mentioned information including name, age, gender and address were recorded in a pre-designed performa. Exclusion criteria were strictly followed to control confounders and bias in the study results.

Data was analyzed by using a statistical software SPSS version 16.0. Mean ± Standard deviation will be calculated for continuous variable like age. Frequency and percentages were calculated for categorical variables like gender, High TIMI risk score and its short term clinical outcome (Arrhythmias, Cardiogenic shock, Cardiac Pulmonary edema and in hospital death). High TIMI risk score and its short term clinical outcome was stratified among age and gender to see the effect modifications. All results were presented in the form of tables and graphs.

RESULTS

A total number of 385 patients with acute myocardial infarction were included in this study. Out of 385 patients presenting with acute myocardial infarction, high TIMI score (i.e. >8) was found in 122(31.84%) patients (table 1). All the patients in study were followed and no patient was lost to follow up.

Out of 122 cases, males were 79(64.75%) and females were 43 (35.25 %).Male to female ratio was 2:1. In this study, mean age was 56.71 ± 10.00 years (range 40 to 75). Patients in age group of 40-50 were 47(38.84%), 51-60 were 38(31.40%), 61-70 were 23(19%) and above 70 were 13(10.74%). Males dominated the study population in all the groups except group of 70 years and above, where females were dominating (9.1% vs. 0.8%).

Among 122 patients with high TMI risk score, 55(45.5%) had score of 9, 12(9.9%) had score of 10, 43(35.5%) had score of 11 and 11(9.1%) had score of 12. Among all four scores, males were dominant across the study population except for score 12 where females were found higher in number than males (9.1% vs. 0.0% respectively). Occurrence of arrhythmia and other complications including death were well correlated with the increasing scores, as it was evident if the whole population was further categorized into sub-groups on the basis of TIMI score, i.e. group I (TIMI score 9-10) and group II (TIMI score 11-12).

Ventricular fibrillation was present in 21(17.4%) of the patients, followed by 15(12.4%) who had an episode of ventricular tachycardia. Atrial Fibrillation was present in only 1(0.8%) while complete heart block was present in 8(6.61%) of patients with high TIMI score (Table 2).

As we move from group I to group II, VF increased (9.1% and 11% respectively. p=0.62) and it was more common among males who were 14(66.6%) of the total cases of VF.

Similarly incidence of VT was 0(0%) and 15(100%) in group I and group II respectively. Frequency of VT was high among females i.e. 9(60%) of the total cases of VT. Atrial fibrillation was present only in 1(0.82%) (Table 2).

CHB occurred in 8(6.61%). All belonged to group II i.e. while no case was reported in group I i.e.0% (p=0.62). It was more common in females i.e. 7(87.5%) of the total cases the CHB (Table 2).

Cardiogenic Shock was present in 29(24.0%). Cardiogenic shock well correlated with the increasing score. Group I had 8(27.58%) and group II had 21(72.41%), p<0.001. It was more common among males and it was 18(62.06%) of the total cases of cardiogenic shock.

Pulmonary edema occurred in 33(27.3%) of the patients (Table 2). It also increased with the increasing score. Group I had 13(39.39%) while group II had 20(60.6%) occurrence of pulmonary edema (p=0.034). Pulmonary edema was more common in males i.e. 22(66.6%) of the total cases of pulmonary edema.

In-hospital death occurred in 22(18.2%). Group I had 6(27.27%) and group II had frequency of 16(72.72%) of the total number of death among patients with high TIMI score (p=0.005). The frequency among gender subgroup are comparable i.e. 12(54.54%)in males vs. 10 (45.45%) in females.

Post infarct Angina was present in 39(32.2%). It increased progressively as the score increased which was evident on the comparison of the subgroups. The frequency was 12(30.76%) in group I while it was 27(69.23%)in group II (p<0.001). The frequency among gender subgroup is comparable i.e.20(51.28%) in males vs. 19(48.71%) in females.

Stroke occurred in 11(9.1%) of the patients with high TIMI score (Table 2). On comparison among groups, it was evident that as the TIMI score increased the incidence also increased progressively. Group I comprised 3(27.27%) while group II comprised 8(72.72%), p=0.026. Males contributed 7(63.63%)and females contributed 4(36.36%)of the total cases of stroke.

For relieve of symptoms, 30(24.8%) patients underwent

Table 1: TIMI Score of Study Populations (n=385)

TIMI score	Frequency (n)	Percentage (%)
8 & Below	263	68.16%
9 & Above	122	31.84%
Total	385	100%

Table 2: Different complications in Study Populations (n=385)

Characteristics	Frequency (n)	Percentage (%)
Age	56.71± 10.00	
Male	79	64.5 %
Female	43	35.5 %
Arrhythmias:		
VF	21	17.4%
VT	15	12.4%
AF	01	0.80%
CHB	8	6.61%
Cardiogenic Shock	29	24.0%
Pulmonary Edema	33	27.3%
Death	22	18.2%
Post Infarct Angina	39	32.2%
Stroke	07	6.06%
Revascularization	28	24.34%

Table 3: TIMI Score & Its Co-relation With Complications (n=385)

Variables	Group 1 (TIMI < 8)	Group 2 (TIMI > 8)	P Value
Arrhythmias:	9.1%	11%	0.62
VF	0	15%	0.001
VT	0	6.61%	0.62
Cardiogenic Shock	27.58%	72.64%	0.001
Pulmonary Edema	39.39%	60.6%	0.034
Death	27.27%	72.7%	0.005
Post Infarct Angina	30.76%	69.25%	0.001
Stroke	21.21%	72.72%	0.26
Revascularization	46.66%	53.3%	0.33

revascularization (Table 2). The frequency in group I & II was14(46.66%) and 16(53.3%) respectively (p=0.033). It was more common in males 18(60%) than females 12(40.0%). All co-relative statistics is shown table 3.

DISCUSSION

Pakistani population being a part of South Asia has the highest known rate of coronary artery disease (CAD).[3] In Pakistan 46% of cardiac deaths are due to myocardial infarction.[12] A country where resource availability is scarce, the only way to reduce this high percentage is prevention. Time, money and efforts spent on this preventive strategy in patients and population are rewarding.[13] The recognition and treatment of complications during acute phase of myocardial infarction remains a difficult dilemma.[14] In addition, increasing economic pressures have intensified the need for appropriate triage and clinical resource utilization, including decisions regarding transfer to tertiary care centers.[15] In particular the capacity to reliably identify patients at very low risk for fatal recurrent events may offer the opportunity to select low-risk patients for early hospital discharge.[16,17] Tools that enhance the clinician's ability to rapidly and accurately assess risks are thus of substantial interest.[18]

Morrow et. al. used the prognostic information from a multivariable analysis in a large and diverse cohort of STEMI patients treated with fibrinolytics,using variables that captured the majority of prognostic information available in the multivariate model to develop a convenient bedside clinical score that may be applied at the time of patient presentation to assess short-term mortality risk.[19]

In our study, males were in high percentage which correlates well with the results in GUSTO, MILLIS, GISSI-2 trials and study done at Aga Khan Hospital which concluded that CAD was more prevalent in male than females.[21-23] Mean age (56.71±10.00) years was in accordance with other studies. The reason for this trend is clear from Framingham heart study, which has shown that incidence of IHD increases almost linearly with advancing age.[24] South Asians including our country has a rapid increase of aged people, changes in life style, decrease physical activity, which leads to obesity and ultimately leading to multiple problems.[25]

Our study showed an increased incidence of death which is comparable to the data published by Masood et al,Anna Kozieradzka et al. and Rathoreet al.[4,9,26] So was the frequency of arrhythmias and complete heart block(CHB)which was also high as compared to international figures reported by González-Pacheco H et al and Masood et al.[4,28] As compared to these studies, our study population had a greater door to needle time due to poor logistic support and also due to delayed diagnosis of MI. Clustering of risk factors for STEMI and high average TIMI Score including diabetes makes them a poor appreciator of the typical symptoms and they are vulnerable to development of arrhythmias which was well correlated with the increasing score. Also infrequent use of primary PCI in MI patients which has a documented superiority over pharmacological reperfusion (thrombolysis), and lastly the tendency of Asian people for higher mortality due to MI.[25,27] Similarly these finding can be explained on the basis of the fact that as our population presented late due to multiple factors and as the time passed, ischemia worsened and the chances of arrhythmia increased which were clearly reflected in our study. Another important factor was the poor appreciation of symptoms by old people.

González-Pacheco H et al. reported similar incidence of 15.3% and 10.9% for heart failure and cardiogenic shock respectively, which is comparable to our data.[28] Possible explanation for this fact may be that those patients were subjected to Primary PCI complemented with IIb/IIIa Inhibitors, which is the standard treatment yields excellent results with high success rate if done by experienced operators which is hardly a case in our setup. In fact none of the study subject underwent emergency PCIs.

Stroke occurred with increased frequency in high risk patients which is high as compared to data reported by González-Pacheco H et al. Result are also attributable to high presenting TIMI score, race, high ischemia burden and lastly due to fact that the tendency of Asian people for higher mortality due to increased burden of atherosclerosis.

CONCLUSION

High TIMI risk score correlates significantly with death and complications like cardiogenic shock and arrhythmias in early post-infarction period. Frequency of complication increases with the increasing score.

REFERENCES

1. Russo CA, Andrews RM. The National Hospital Bill: the most expensive condition by Payer.JAMA 2006;4:18-25.
2. Joshi P, Islam S, Pais P. Risk factors for early myocardial infarction in South Asians compared with individuals in other countries. JAMA 2007;297:286-94.
3. Jafar TH, Jafary FH, Jessani S, Chaturvedi N. Heart disease epidemic in Pakistan: women and men at equal risk. Am Heart J 2005;150(2):221-6
4. Masood A, Naqvi MA, Jafar SS, Mufti AA, Akram Z. In-Hospital outcome of acute myocardial infarction in correlation with 'thrombolysis in myocardial infarction' risk score. J Ayub Med Coll Abbottabad 2009;21(4):24-7.
5. Rott D, Leibowitz D, Schwartz R, Weiss AT, Behar S, Hod H.Combination of the Killip and TIMI classifications for early risk stratification of patients with acute ST elevation myocardial infarction.Cardiology 2010;117(4):291-5.
6. Truong Q, Cannon CP, Zakai NA, Rogers IS, Giugliano RP, Wiviott SD, et al.Thrombolysis inmyocardial infarction (TIMI) risk index predicts long-term mortality and heart failure in patients with ST-elevation myocardial infarction in the TIMI 2 clinical trial.Am Heart J 2009;157(4):673-9.
7. Lev EI, Kornowski R, Vaknin-Assa H, Porter A, Teplitsky I, Ben-Dor I, et al. Comparison of the predictive value of four different risk scores for outcomes of patients with ST-elevation acute myocardial infarction undergoing primary percutaneous coronary intervention. Am J Cardiology 2008;102:6-11.
8. Golabchi A, Sadeghi M, Sanei H,Akhbari MR, Seiedhosseini SM,Khosravi P, et al.Can TIMI risk score predict

angiographic involvement in patients with ST-elevation myocardial infarction. ARYA Atheroscler2010;6(2):69-73.

9. Kozieradzka A,Kamiński K,Dobrzycki S,Nowak K, Musial W.TIMI risk score accurately predicts risk of death in 30-day and one-year follow-up in STEMI patients treated with primary percutaneous coronary interventions. Kardiol Pol 2007;65(7):788-95.
10. Gale CP,Manda SO, Batin PD,Birkhead J,Hall AS.Validity of the TIMI risk scores for UA/NSTEMI and STEMI. Circulation 2006;114(Suppl 18):829.
11. Herrmann HC1, Lu J, Brodie BR, Armstrong PW, Montalescot G, Betriu A, Neuman FJ, et al. Benefit of facilitated percutaneous coronary intervention in high-risk ST-segment elevation myocardial infarction patients presenting to nonpercutaneous coronary intervention hospitals. JACC CardiovacInterv2009;2(10);917-24.
12. Iqbal MP, Khan AH, Mehboobali N, Iqbal SP. Human paraoxonase and HDL-cholesterol in Pakistani patients with acute myocardial infarction and normal healthy adults. Pak J Med Sci 2007;23:659-64.
13. Shiplay MJ, Pocock SJ, Marmot MG. Does plasma cholesterol concentration predict mortality from coronary heart disease in elderly people? 18 years follow up in white Hall Study. BMJ 1991;303:89-92.
14. Di Bella G, Aquaro GD, Strata E, Deiana M, De Marchi D, Lombardi M, et al. Simultaneous visualization of myocardial scar, no-reflow phenomenon, ventricular and atrial thrombi by cardiac magnetic resonance.Int J Cardiol 2007;115:10-1.
15. Mark DB. Medical economics in cardiovascular medicine. In: Topol EJ, edetor. Textbook of cardiovascular medicine. Philadelphia: Lippincott-Raven;1998. P. 1033-61.
16. Newby LK, Califf RM, Guerci A, Weaver WD, Col J, Horgan JH, et al. Early discharge in the thrombolytic era: an analysis of criteria for uncomplicated infarction from the Global Utilization of Streptokinase and t-PA for Occluded Coronary Arteries (GUSTO) trial. J Am CollCardiol 1996;27(3):625-32.
17. Antman EM, Kuntz KM. The length of the hospital stay after myocardial infarction. N Engl J Med 2000;342:808-10.
18. Zapata G. Predicciónтempranadelriesgo en el Infartoagudo de miocardio: unadifíciltarea de todos los días. Rev Fed ArgCardiol 2011;40:1-2.
19. Morrow DA, Antman EM, Charlesworth A, Cairns R, Murphy SA, de Lemos JA, et al.TIMI risk score for ST-elevation myocardial infarction: a convenient, bedside, clinical score for risk assessment at presentation: an intravenous nPA for treatment of infarcting myocardium early II Trial Substudy. Circulation 2000;102(17):2031-7.
20. The GUSTO investigator. An international randomised trial comparing four thrombolytic strategies for acute myocardial infarction. NEng J Med 1993;329:673-82.
21. ToflerGH,StonePH,MachureM.Analysis of possible triggers of acute myocardial infarction (The MILIS study). Am J Cardiol 1990;22:66-7.
22. Maggioni AP, Franzosi MG, Santoro E, White H, Van de Werf F, Tognoni G. The risk of stroke in patients with acute myocardial infarction after thrombolytic and antithrombotic treatment. GruppoItaliano per lo Studio dellaSopravvivenzanell'InfartoMiocardico II (GISSI-2), and The International Study Group. NEngl J Med 1992;327(1):1-6.
23. Ishaq M, Beg MS, Ansari SA, Hakeem A, Ali S. Coronary artery disease risk profiles at a specialized tertiary care centre in Pakistan. Pakistan J Cardiol 2003;14:61-8.
24. Levy D, Kannel WB. Cardiovascular risk: new insight from Framingham. Am Heart J 1988;116;266-72.
25. Ghaffar A, Reddy KS, Singhi M. Burden of non-communicable diseases in South Asia. BMJ 2004;328:811-5.
26. Rathore SS, Weinfurt KP, Gross CP, Krumholz HM. Validity of a simple ST-elevation acute myocardial infarction risk index: are randomized trial prognostic estimates generalizable to elderly patients? Circulation 2003;107:811.
27. Rashid S, Khandaker N. Risk factors for early myocardial infarction in South Asia. JAMA2007;297:1880-1.
28. González-Pacheco H, Arias-Mendoza A, Álvarez-Sangabriel A, Juárez-Herrera Ú, Damas F, Eid-Lidt G, et al. The TIMI risk score for STEMI predicts in-hospital mortality and adverse events in patients without cardiogenic shock undergoing primary angioplasty. Arch CardiolMex 2012;82(1):7-13.