



TIMI RISK SCORES;

FREQUENCY OF DOUBLE VESSEL CORONARY ARTERY DISEASE IN DIFFERENT TIMI SCORES IN PATIENTS PRESENTING WITH NON ST-ELEVATION ACUTE CORONARY SYNDROME AT GULAB DEVI CHEST HOSPITAL

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ABSTRACT... Background: Thrombolysis In Myocardial Infarction (TIMI) risk score predicts adverse clinical outcomes in patients with non-ST-elevation acute coronary syndromes (NSTEMI). Whether this score correlates with the coronary anatomy is unknown. **Objective:** To determine the frequency of low, moderate and high TIMI risk score in patients of NSTEMI-ACS and to compare the frequency of two vessel coronary artery disease on angiography with low, moderate and high TIMI risk scores in patients of NSTEMI-ACS. **Study design:** This was a cross sectional study. **Setting:** Department of Cardiology, Gulab Devi Chest Hospital, Lahore. **Duration:** Six months. **Patients and Methods:** Total 170 patients were included in the study. Patients' selection was done with the help of a pre-defined inclusion and exclusion criteria. TIMI risk score was calculated for each patient and patients were categorized into low, moderate and high risk groups (as per operational definition). Patients were further evaluated with coronary angiograms to assess the double vessel CAD. All angiographies were performed by a single physician. Data analysis was done on SPSS version 17. **Results:** Mean age of our patients was 54.81 ± 10.55 years. Gender distribution shows that there were 106(62%) male and 64(38%) female patients. TIMI score risk classification showed that among 50(29.4%) patients TIMI risk score was low, among 107(62.9%) patients it was moderate and in 13(7.6%) patients it was high. There were 105(62%) patients who had two vessel coronary artery disease. Among 105 patients who had two vessel coronary artery disease, 25(23.8%) had low TIMI score, 69(65.7%) had moderate and 11(10.5%) of the patients had high TIMI score. **Conclusion:** In patients with non-ST-elevation acute coronary syndrome undergoing cardiac catheterization, the TIMI risk score is significantly associated with two vessel coronary artery disease. So it should be recommended that a routine invasive strategy be carried in patients with moderate or higher TIMI risk score.

Key words: TIMI risk score, Thrombolysis, Two vessels coronary artery disease, Non ST Elevation Acute Coronary Syndrome, Angiography.

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INTRODUCTION

Ischemic heart disease (IHD) is an ever growing health and economic burden not only in the industrialized world but also in the developing countries.¹ Along with its dreadful complications, acute coronary syndrome (ACS) is the most feared presentation of the ischemic heart disease, carrying substantial morbidity and mortality.² Various scoring systems have been developed to risk stratify patients following an episode of ACS. The Thrombolysis in Myocardial Infarction (TIMI) research group has been widely accredited for therapeutic advancements in Non ST elevation

acute coronary syndrome (NSTEMI-ACS) including non ST elevation myocardial infarction (NSTEMI) and unstable angina (USA).³ The TIMI risk score calculator for NSTEMI-ACS uses clinical parameters including age, co-morbidities like diabetes mellitus, hypertension, angina, documented coronary artery disease, ST segment deviation and elevated cardiac enzymes for risk stratification.⁴ Each parameter is given a score and the total score is simply added up.

This study aims to standardize the approach for the management of patients with NSTEMI-ACS

across various emergency facilities in the country by classifying patients into low, moderate and high risk categories and identifying their association with extent of coronary artery disease. This study may give us valuable information regarding occurrence of two vessels CAD when compared with different TIMI risk score patients of NSTEMI-ACS and will help the cardiologists to manage the patients accordingly.

MATERIALS & MEHTODS

Design and Setting

It was a cross sectional survey of 170 patients with NSTEMI-ACS presented in CCU of Gulab Devi chest hospital. Study was completed in six months.

Sampling technique

Using non probability (purposive) sampling a sample size of 170 cases was calculated with 95% confidence level, 4% margin of error and taking the expected percentage of high TIMI risk score patients i.e. 7.53% in patients with NSTEMI-ACS.

Sample selection criteria

All patients with ages between 30 to 80 years, irrespective of gender confirmed through clinical investigations and other diagnostic procedures notably echocardiography were included in the study. Foreigner patients and those having any other co-morbid pathology viz. renal failure & patients with advanced liver disease were excluded.

Data collection methods

After taking verbal consent patients were interviewed. Including basic demographic details all the data were recorded on a short structured questionnaire. Patients were asked about the presence of chronic hypertension and diabetes mellitus. Information was also obtained regarding smoking history and history of heart disease in first degree relatives. TIMI risk score was calculated for each patient and patients were categorized into low, moderate and high risk groups (as per operational definition). Patients were further evaluated with coronary angiograms to assess the two vessels CAD. All angiographies were

performed by a single physician.

Statistical techniques

Both descriptive and inferential statistical analyses were done in Statistical Package for Social Sciences (SPSS) version 16.0. Categorical data were presented as percentages and in form of graphs while descriptive and frequency distribution was used for quantitative analyses. P-value ≤ 0.05 was considered as significant.

RESULTS

Total 170 patients having NSTEMI-ACS presenting through cardiac emergency were admitted in CCU, Gulab Devi Hospital Lahore. Table-I shows basic demographic profile of our patients. There was an overall male predominance (62%). Male to female ratio was 1.6:1. Mean age of male and female patients was 56.53 ± 10.10 and 51.96 ± 10.74 years respectively.

Age in years (mean \pm S.D)	54.81 \pm 10.55
Range	77-36 = 41
Gender n (%)	
Males	106 (62%)
Females	64 (38%)

Table-I. Basic demographic profile

TIMI Risk Scores n (%)	
Age > 65 years	30 (17.6%)
>3 risk factors for CAD	52 (30.5%)
Prior documented CAD > 50 %	37 (21.7%)
ST deviation >0.5 mm	138 (81%)
>2 episodes of angina in last 24 h	101 (59.4%)
ASA use within prior week	51 (30%)
Elevated cardiac markers	92 (54%)
Angiographic Findings n (%)	
Left anterior descending (LAD)	109 (64.1%)
Left circumflex (LCx)	94 (55.3%)
Right coronary artery (RCA)	88 (51.8%)

Table-II. TIMI risk scores & angiographic findings

TIMI risk stratification in Table-II shows that there were 30 patients who were >65 years old, 52 patients were having >3 risk factors for CAD, in 37 patients prior documented CAD was >50%, in 138 patients ST deviation was >0.5 mm, 101

		Two vessel CAD		Total
		Yes	No	
TIMI SCORE	Low (0-2)	25 (23.8%)	25 (38.5%)	50 (29.4%)
	Moderate (3-4)	69 (65.7%)	38 (58.5%)	107 (62.9%)
	High (5-7)	11 (10.5%)	2 (3.1%)	13 (7.6%)
Total		105	65	170

Table-III. Double vessel coronary artery disease in relation to TIMI risk score

patients were having > 2 episodes of angina in last 24 hours, 51 patients had aminosalicic acid (ASA) use within prior week and 92 patients had elevated cardiac markers. Coronary angiography findings show LAD involvement in 109(64.1%) patients, involvement of LCX in 94(55.3%) patients and involvement of RCA in 88(51.8%) patients.

Table-III shows double vessels coronary artery disease in relation to TIMI risk score. With respect to TIMI score risk classification score was low, moderate and high in 50(29.4%), 107(62.9%) and 13(7.6%) of patients respectively. There were 105(61.8%) patients who had two vessel coronary artery disease. Among 105 patients who had two vessel coronary artery disease 25(23.8%) patients had low TIMI score, 69(65.7%) had moderate and 11(10.5%) of the patients had high TIMI score. The TIMI risk score was significantly associated with double vessel coronary artery disease as p-value was 0.04 (significant).

DISCUSSION

Following an episode of acute myocardial infarction many scoring systems have been developed to risk stratify patients.⁵ When originally developed, the TIMI risk score was correlated by Antman et al⁶ with clinical endpoints of Non-ST-elevation ACS, as death and myocardial infarction. The TIMI risk score performs well both for short-term (14-day) and long-term (6-months) end points and in a variety of patient populations, including UA/NSTEMI clinical trials and cohorts of patients presenting with chest pain.^{7,10}

The findings of our study are quite comparable with other studies conducted in different regions. Garcia et al reported low TIMI score (0-2) among 41% patients, moderate score (3-4) among 44% patients and high score (5-7) among 15% of their

patients.¹¹ These findings are different with that of our study as in our study only 7.6% patients had high TIMI risk scores.

With respect to double vessel disease the findings of our study are quite similar to Gracia et al as they reported that 116 patients had two vessel disease. Among these patients 19.2% patients had low, 67.24% had moderate and 12.93% had high TIMI score.¹¹ While in our study 105 patients had two vessel disease. Among these patients 25(23.8%) had low, 69(65.7%) had moderate and 11(10.5%) had high TIMI score. The study of Garcia et al given a cutoff of ≥ 5 correctly differentiated patients with 3-vessel or left main disease from those without these diseases in 80% of cases.

Ben Salem¹² and his colleagues determined the correlation of TIMI risk score with angiographic extent and severity of coronary artery disease in non ST-elevation acute coronary syndromes patients. In their study the overall distribution of TIMI score was reported as low in 121 (50.62%) patients, moderate in 100 (41.84%) patients and high in 18 (7.53%). Although the distribution of TIMI score in Ben Salem¹² study is different for low and moderate score when compared with our study but the distribution for high score was consistent with our study.

Avci et al¹³ in their study concluded that in patients with NSTEMI, both GRACE and TIMI risk scores are correlated with the extent and severity of CAD. Therefore, in patients with higher GRACE and TIMI risk scores, CAD can be predicted to be more diffuse and severe.

Mega et al¹⁴ in his study reported that TIMI risk score identifies patients who are more likely to have intracoronary thrombus, impaired flow, and

increased burden of coronary atherosclerosis. These findings likely explain in part the particular benefit of potent anti-thrombin and anti-platelet agents among patients with higher risk scores. Several other scoring systems have been used like The Gensini scoring system which is used in order to determine the severity and extent of coronary artery disease.^{15,16}

With respect to TIMI risk score the most attractive aspect is that it can be estimated at the bedside with easy to obtain clinical, laboratory, and electrocardiographic parameters. If a correlation between TIMI risk score and coronary artery disease is present then estimating the coronary anatomy before angiography is performed could be useful when deciding on diagnostic and therapeutic interventions.

CONCLUSION

In patients presenting with NSTEMI-ACS, two vessel disease was present in 61.8% of patients and majority of these patients (65.7%) had moderate TIMI risk score. In patients with non-ST-elevation acute coronary syndrome clinical risk assessment by using TIMI risk score can predict the presence and extent of coronary artery disease on angiography and the moderate TIMI score is strongly associated with the occurrence of two vessels disease. So in NSTEMI-ACS invasive approach with coronary angiography and revascularization should be a preferred management strategy in patients with moderate or high TIMI risk score.

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“It's easier to fool people than to convince them they have been fooled.”

Mark Twain



AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Usman Javed Iqbal	Literature review, Designing and Writing of manuscript	
3	Nasir Iqbal	Critical / Proof reading, Suggestions	