IN HOSPITAL MORTALITY AMONG PATIENTS WITH HIGH PLATELET /LYMPHOCYTE RATIO PRESENTING WITH ST SEGMENT ELEVATION MYOCARDIAL INFARCTION

Iftikhar Hussain[a*], Salman Ahmad[a], Muhammad Zaman[a],Muhammad Aqeel[a], Samra Y. Haq[a], Kashif Zafar[a]

ABSTRACT:

BACKGROUND: Increased platelet activation with increased platelet count and reduction in lymphocyte count (platelet to lymphocyte ratio) is recognized as a marker of inflammation and is linked with adverse cardiovascular events. The objective of this study was to determine in- hospital mortality among patients suffering from ST elevation myocardial infarction (STEMI) and having high platelet to lymphocyte ratio .

MATERIAL AND METHODS: We did this study in Punjab institute of cardiology, Lahore from 0ct 19, 2015 to April 18, 2016. One hundred and twenty patients having high platelet/lymphocyte ratio (>144) were enrolled. Absolute platelet and lymphocyte counts were calculated and platelet to lymphocyte ratios derived. The enrolled patients were followed during their hospital stay for mortality.

RESULTS: A total of 120 patients were studied. Mean age of the study population was 44.9 + 8.3 years and 85 (70.8%) were males. Overall 15 (12.5%) patients died in hospital. Out of those who died, 9 were male and 6 were female. There was a non significant trend for higher mortality in women with high platelet / Lymphocyte ratio; 17.1% vs 10.6 % (p valve 0.367).

CONCLUSION: A mortality of 12.5% was observed among patients suffering from STEMI and having high platelet to lymphocyte ratio.

KEY WORDS: Platelet to lymphocyte ratio, ST elevation myocardial infarction, In-hospital mortality

INTRODUCTION

Ischemic heart disease (IHD) is a major cause of morbidity and death.[1,2] Acute coronary syndrome (ACS) consists of unstable angina, non-ST segment elevation myocardial infarction (NSTEMI), and ST segment elevation myocardial infarction (STEMI).[3]

STEMI remains a major health problem in both industrialized and the poor countries.[4] In the United States, almost 600,000 patients are admitted to hospitals each year with a main diagnosis of ACS. The number exceeds 1 million with the inclusion of ACS as a secondary diagnosis.[5]

World health organization (WHO) states that by 2020 the universal burden of coronary artery disease (CAD) may rise up to 11.1 million.[6] Paki-

[a]Department of Cardiology,
Punjab Institute of Cardiology,
Lahore - Pakistan.

* Corresponding author:
Email: ifti110@yahoo.com

stani people belong to an ethnic group which have highest prevalence of coronary artery disease.[7]

An increasing trend is seen in the burden of acute coronary syndrome in the Pakistani population with increasing presentation as STEMI.[8] One possible explanation is the highest percentage of its risk factors like increase in blood pressure, hypercholesterolemia and obesity, especially in developing countries. Therefore, mortality due to STEMI has shown considerable increase during the past decade.[9]

Acute Coronary syndromes are managed with antiplatelet and anticoagulant therapy, antiischemic therapy, fibrinolysis ,catheter based reperfusion strategies and adjuvant pharmacologic therapy. So it is important to stratify the patients according to the severity of illness in order to guide further treatment.

In order to decrease morbidity and mortality associated with ACS, it is essential to treat the patients according to risk stratification. As inflammation has an important role in pathophysiology of ACS[10], inflammatory markers like elevated platelets count and decrease lymphocyte count are associated with increase cardiovascular morbidity and

mortality.[11,12] This study was conducted to determine the frequency of in hospital mortality among patients who were admitted with a diagnosis of STEMI and had elevated Platelet to Lymphocyte ratio (PLR).

MATERIAL AND METHODS:

This descriptive case series was done at Punjab institute of cardiology, Lahore from Oct 19, 2015 to April 18, 2016. Cases were selected from emergency and inpatient department of cardiology. A sample volume of 120 cases was calculated with 95% confidence level, 5% margin of error and expected percentage of in-hospital mortality among patients with high platelet lymphocyte ratio as 12.7% [13].

Inclusion criteria were age 20 – 60 years, both genders, patients with acute ST elevation myocardial infarction and high platelet-lymphocyte ratio i.e., > 144.[13]

Exclusion criteria were patients with intracranial hemorrhage on CT scan, patients taking Clopidogrel, patients with valvular heart disease determined by history and echocardiography, patient with renal dysfunction determined on raised creatinine >1.4 mg/dl and patients with chronic liver disease as determined by history or raised ALT > 60 IU/L on admission. Informed consent was obtained from all patients. STEMI was diagnosed according to standard Electrocardiographic and biochemical criteria. At the time of admission, complete blood counts of all patients were analyzed by Sysmex KX-21 hematology analyzer. Absolute platelet and lymphocyte counts were calculated and absolute platelet count was divided by absolute lymphocyte count to get the platelet to lymphocyte ratios. All the baseline information like demographic data was noted. All patients were given the guidelines directed medical therapy and were followed up till discharge from hospital. Any mortality was recorded and confidentiality of the data was ensured.

Data was analyzed by using SPSS version 17.0. Numerical variables i.e. age and platelet/lymphocyte ratio were summarized as mean and standard deviation. Qualitative variables like sex and in-hospital mortality among patients with high platelet lymphocyte ratio were presented in the form of frequency and percentages.
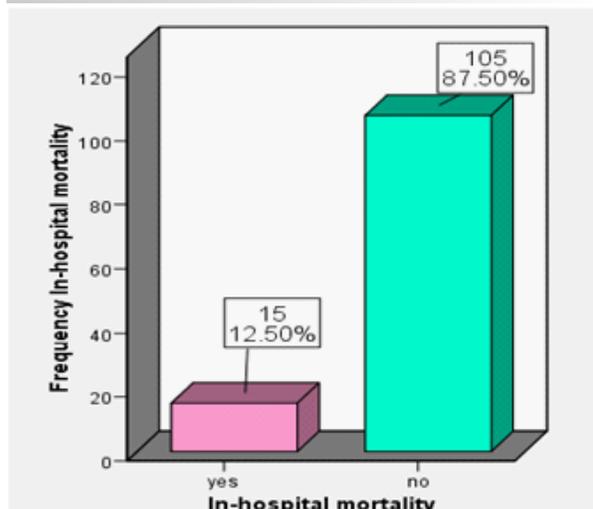
RESULTS:

Mean age of 120 patients was 44.88±8.30 years- Figure 1. There were 85 (70.8%) males and 35 (29.2%) females. Mean age for male and female patients was 43.98±8.25 and 47.06±8.13
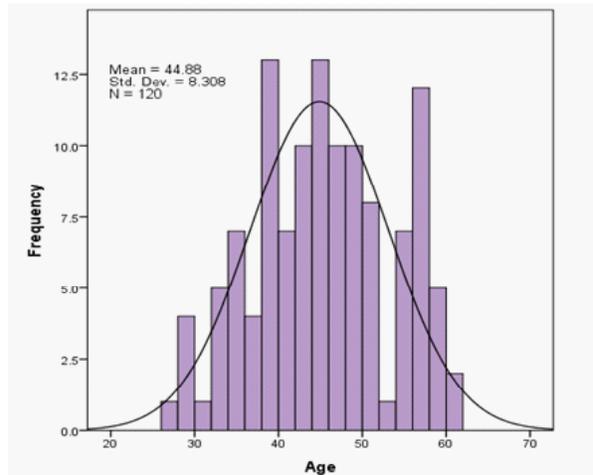
Figure-1: Graphical distribution with respect to age
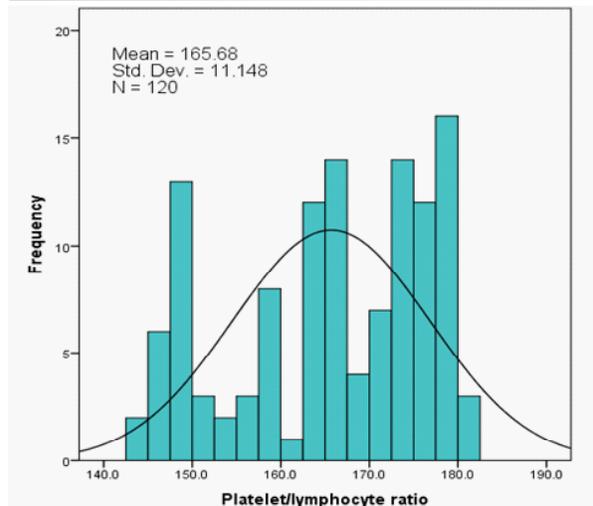
Figure-2: Graphical distribution of Platelet/lymphocyte ratio

Figure-3: Graphical distribution of in-hospital mortality

years respectively (P = 0.065).

Mean platelet / lymphocyte ratio (PLR) of the total 120 patients was 165.68±11.14- Figure 2. Male and female patients had mean PLR 166.71±11.03 and 163.18±11.18 respectively (P = 0.115) (Figure-2).

As far as in-hospital mortality is concerned, overall 15 (12.5%) patients expired (Figure-3). In hospital mortality for men and women was 9 (10.6%) and 6 (17.1%) respectively, p= 0.367.

DISCUSSION:

Inflammation plays a pivotal role in coronary artery disease (CAD). Body defense cells dominate early in atherosclerotic lesions, and activation of inflammation can elicit acute coronary syndromes (ACS). Various inflammatory markers have been investigated regarding risk stratification of patients with ACS. Increase in platelet counts and decrease in lymphocyte count is associated with increased cardiovascular morbidity and death. Therefore, both parameters have emerged as an inflammatory marker of adverse cardiovascular outcomes.[14,15,16] There is no local study in Pakistan for association of PLR with in-hospital mortality in patients with STEMI.

In our study the in hospital mortality of patients with STEMI and high PLR was 12.5%. Our result are consistent with previous studies. Oylumlu M et al [17] showed that patients with upper PLR had increased in hospital mortality than patients with middle and lower PLR tertile groups [14.8% vs. 8.7% and 1.0%; p<0.001]. The patients were divided into different groups according to PLR. Patients with high PLR had increased mortality than lower PLR group (12.7% vs. 5.9%, p=0.004).[13] These values are close to our finding. In our study out of total 120 patients with high PLR, 85(70.8%) were males and 35(29.2%) were females which is very close to previous studies. Male gender in high PLR group in studies conducted by Oylumlu M et al [17], Temiz A et al [13], Toprak C et al [18] and Osadnik T et al [19] was 66.2% ,73% ,76% and 66.4% respectively.

We found that females had a higher trend to die early but it was statistically not significant (17.1% vs 10.6 %).[13]

In most previous studies it was shown that patients with age above 60 years had increased in hospital mortality among STEMI patients with high PLR. [13,17,19] we had no such observation. In Conclusion, we found high mortality among patients with High PLR among STEMI patients.

Author's Contribution

IH:Conducted the study and wrote the article. SA: Review the article. MZ: Re-arranged data and corrected the article. MA and SYH and KZ gave frequent advice, corrections and did the proof reading.

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