

Prognostic Importance of WBC Count in Acute Myocardial Infarction

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Article Info: Received 15 January 2022; Accepted 15 March 2022

doi: <https://doi.org/10.32553/ijmbs.v6i3.2483>

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Conflict of interest: No conflict of interest.

Abstract

Background: The objective of this study was to determine whether the WBC count is associated with in-hospital mortality & morbidity for patients with ischemic heart disease after controlling for potential confounders.

Methods: This study was prospective study. 100 patients presenting within 24hrs with Acute MI and qualifying inclusion criteria were enrolled and written consent was taken regarding participation in the study.

Results: Out of 100 patients had LV dysfunction, among these 30 patients 21 were having elevated WBC count and 9 had normal WBC count. Among 100 patients 14 had cardiogenic shock, among these patients 9 had elevated WBC count and 5 had normal WBC count. Among 100 patients 8 patients died, among these patients 7 patients had elevated WBC count and 1 patient had normal WBC count.

Conclusion: Elevated WBC count within 24 hours was associated with high rate of complications after acute myocardial infarction.

Keywords: ST, Non ST, WBC.

Introduction

Myocardial Infarction (MI) is a term which is used for defining the necrosis in the heart muscle due to the lack of the oxygen need of myocardium which cannot be supplied by the coronaries. It is characterized by chest pains or discomfort which may travel into the shoulder, arm, back, neck or jaw.¹

Acute myocardial infarction (AMI) is considered more appropriately part of a spectrum referred to as acute coronary syndromes, which also includes unstable angina and non-ST-elevation. Patients with ischemic discomfort may or may not have ST-segment elevation. Most of those with ST-segment elevation will develop Q waves. Those without ST elevations will ultimately be diagnosed with unstable angina based on the presence of cardiac enzymes. Approximately 90% of myocardial infarction

results from an acute thrombus that obstructs an atherosclerotic coronary artery.² The highest risk of fatality occurs within the initial hours of onset of AMI. Thus, early diagnosis of cardiac ischemia is critical for the effective management of patients with AMI. Improper diagnosis of patients with chest pain often leads to inappropriate admission of patients without AMI and vice versa. In addition to clinical history, physical examination, accurate electrocardiogram findings and assessment of cardiac biomarkers have an important role in the early diagnosis of acute ischemia.³

Methods

100 patients presenting to hospital within 24hrs with Acute MI and qualifying inclusion criteria were enrolled and written consent was taken regarding participation in the study.

Patients of age of more than 18 years with ST segment elevation acute myocardial infarction (STEMI) or non-ST segment elevation acute myocardial infarction (NSTEMI) on the basis of clinical history, examination, ECG changes and biochemical markers like Troponin T, CK-MB presenting to hospital within 24 hours were included in our study.

Patients with prior history of infarction, known case of cardiomyopathies were excluded. Similarly, presentation with fever, recent infection with 1 week, history of trauma, malignancy, myeloproliferative disorders, and recent surgical intervention that might have altered the leukocyte count, were excluded.

Data Analysis:

Data was recorded as per Performa. The data analysis was computer based; SPSS-22 was used for analysis. For categoric variables chi-square test was used. For continuous variables independent samples's *t*-test was used. *p*-value <0.05 was considered as significant.

Results

In a total of 100 patients participated in our study 65 patients were male and 35 patients were females. This distribution shows the predominance of acute myocardial infarction among males. The mean age of patients was 54.36±15.23 Yrs.

Table 1. Association between WBC counts and complications of acute myocardial infarction

Complications	WBC count <11000/mm ³ (n=50)	WBC count >11000/mm ³ (n=50)	Total	P-value
Left ventricular failure	9	21	30	<0.05
Cardiogenic shock	5	9	14	<0.05
Long hospital stay (>7days)	15	26	41	0.001
In hospital mortality	1	7	8	<0.05

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Discussion

The leukocyte response that occurs following AMI is a central part of the inflammatory reparative response that is initiated to replace the necrotic tissue with scar tissue. This may suggest that the greater the amount of necrosis, the larger the leukocyte response, an assertion based on experimental studies that show a direct

relationship between the extent of necrosis and the level of both the local and the systemic leukocyte response^{4,5}.

In our study, we found that 50% patients were having high WBC count (>11000). Association between WBC count and acute cardiogenic shock first described by Friedman et al.⁶ in 1974

In our study we found that high WBC count was associated with more complications like left ventricular dysfunction, cardiogenic shock, long hospital stay, in hospital mortality after myocardial infarction. Same results were found by Furman et al.⁷.

WBC count can be a useful biochemical tool for risk stratification of acute myocardial infarction. It is readily available and rather a cheaper

investigation.

Conclusion

Elevated WBC count within 24 hours was associated with high rate of complications after acute myocardial infarction.

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