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Prognostic Importance of WBC Count in Acute Myocardial Infraction

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Abstract

Background: An increase in white blood cell (WBC) count and a high plasma glucose level are frequently observed in patients with acute myocardial infarction. WBC count is a simple marker of inflammation, which plays an important role in acute coronary syndrome.

Methods: This study was prospective study. 50 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.

Results: Out of 50 patients 12 had LV dysfunction, among these 12 patients 8 were having elevated WBC count and 4 had normal WBC count. Among 50 patients 7 had cardiogenic shock, among these7 patients 5 had elevated WBC count and 2 had normal WBC count.

Among 50 patients 6 patients died, among these 6 patients 5 patients had 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 segment elevation myocardial infarction (STEMI), Non ST segment elevation myocardial infarction (NSTEMI), White blood cell (WBC).

Introduction

An increase in white blood cell (WBC) count and a high plasma glucose level are frequently observed in patients with acute myocardial infarction. WBC count is a simple marker of inflammation, which plays an important role in acute coronary syndrome. It is seen that WBC count plays a potential role in promoting blood coagulation, mediating microvascular reflow, and causing myocyte dysfunction.[1]

A number of prospective epidemiologic studies have demonstrated that an elevated WBC count is associated with risk factors for coronary heart disease,[2-4] acute myocardial infarction (AMI), coronary artery disease and related events, all-cause mortality, and long-term mortality in patients with known coronary artery disease.[5]

While an elevated WBC count has been shown to be an independent predictor of long-term cardiac mortality and all-cause mortality, there have been few studies[6-7] examining the association between elevated WBC count and early death. The purpose of this study was to determine whether the WBC count at presentation is associated with in-hospital mortality in AMI patients after controlling for demographics, medical history, presenting clinical characteristics as well as medications given within 24 hours of presentation, and diagnostic and therapeutic procedures administered during hospitalization.

Methods

50 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.

Inclusion criteria

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.

Exclusion criteria

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.

Results

In a total of 50 patients participated in our study 36 patients were male and 14 patients were females. This distribution shows the predominance of acute myocardial infarction among males.

Table 1. Gender wise distribution

Gender	No of patients	Percentage
Male	36	72.00%
Female	14	28.00%
Total	50	100.00%

Table 2. Association between WBC counts and complications of acute myocardial infarction

Complications	WBC count <11000/mm^3 (n=28)	WBC count >11000/mm^3 (n=22)	Total	P-value
Left ventricular failure	4	8	12	<0.05
Cardiogenic shock	2	5	7	<0.05
Long hospital stay (>6days)	6	13	19	<0.001
In hospital mortality	1	3	4	<0.05

Out of 50 patients 12 had LV dysfunction, among these 12 patients 8 were having elevated WBC count and 4 had normal WBC count.

Among 50 patients 7 had cardiogenic shock, among these7 patients 5 had elevated WBC count and 2 had normal WBC count.

Among 50 patients 6 patients died, among these 6 patients 5 patients had WBC count and 1 patient had normal WBC count.

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[8,9].

In our study, we found that 45% patients were having high WBC count (>11000). Association between WBC count and acute cardiogenic shock first described by Friedman et al.[10] 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.[11].

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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