|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
NLM (National Library of Medicine ID: 101738825)
Index Copernicus Value 2018: 75.71
Original Research Article
Volume 4, Issue 6; June: 2020; Page No. 201-203

PROGNOSTIC IMPORTANCE OF WBC COUNT IN ACUTE MYOCARDIAL INFRACTION

Dr. Devendra Kumar Agarwal[1], Dr. Ankush Singhal[2], Dr. Pawan Singhal[3], Dr. Ratan Lal Ranka[4]
[1]Professor, [2,3] DM Cardiology (Student), [4] Medical officer
[1] Department of General medicine, Sardar Patel Medical College, Bikaner
[2-4] Department of Cardiology, Sardar Patel Medical College, Bikaner

Article Info: Received 04 June 2020; Accepted 26 June 2020
DOI: https://doi.org/10.32553/ijmbs.v4i6.1253
Corresponding author: Dr. Devendra Kumar Agarwal
Conflict of interest: No conflict of interest.

Abstract

Background: This study is done to know the prognostic importance of WBC count and blood glucose at admission in acute myocardial infarction

Methods: This study was prospective study. 100 patients presenting to Department of cardiology, Sardar Patel Medical College, Bikaner within 24hrs with Acute MI.

Results: Out of 100 patients 15 had LV dysfunction, among these 15 patients 9 were having elevated WBC count and 6 had normal WBC count. Among 100 patients 11 had cardiogenic shock, among these11 patients 7 had elevated WBC count and 4 had normal WBC count. Among 100 patients 7 patients died, among these 7 patients 5 patients had elevated WBC count and 2 patient had normal WBC count.

Conclusion- Elevated WBC count at admission has a prognostic importance as independent and joint variables in predictors for short-term outcome in the form of in-hospital mortality in acute myocardial infarction cases.

Keywords: ST segment elevation myocardial infarction (STEMI), Non ST segment elevation myocardial infarction(NSTEMI), White blood cell (WBC).

Introduction

Coronary artery disease is the major cause of death in most modern societies across the globe. In addition, the disease leads to high morbidity, disability and loss of productivity. The clinical symptoms of coronary heart disease contain a spectrum of silent ischemia to chronic stable angina, unstable angina, acute myocardial infarction, ischemic cardiomyopathy, sudden cardiac death, arrhythmias and cardiogenic shock. Currently, 900,000 people are diagnosed with acute myocardial infarction (AMI) in the United States each year, of those about 225,000 die due to arrhythmia or heart failure. Systemic inflammation is triggered by myocardial infarction which is associated with the release of hematopoietic precursor cells from bone marrow into blood stream. Understanding the cellular changes during AMI could be practically prognostic. Likewise, it has been shown that immunologic changes following AMI have prognostic value for severity of AMI; however, are independent of risk factors and number of arteries involved. It has been show that there is a significant correlation between the ischemic severity and the magnitude of cellular changes as a consequence of acute phase response.[1]

An increase in white blood cell (WBC) count 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 refl ow, and causing myocyte dysfunction.[2,3]

Methods

Type of study- Hospital based cross-sectional study.

Study place- Haldiram Moolchand Govt. center of cardiovascular Science & Research, Bikaner

***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.

Methods of data collection-100 consecutive patients presenting with acute myocardial infarction admitted to Cardiac care unit, Haldiram Moolchand Govt. center of cardiovascular Science & Research, Bikaner were studied.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. Diagnostic criteria of AMI were typical or atypical chest pain that were confirmed by changes in pattern of ECG and increased levels of blood or cardiac enzymes. Complete blood count for each patient was performed within 48 hours after admission. Several parameters including age, sex, mortality rate, location of myocardial infarction, and changes in leukocyte and hemoglobin levels were studied.

Data analysis- Data were analyzed using Epi-info statistical software. The frequency for qualitative variables and mean and standard deviation for quantitative variables were calculated. Chi-square and Fisher's exact tests were used for hypothesis analysis. Binary logistic regression model was used to identify the prognosis factors during the 6-month period. The confidence limit was 95% and P<0.05 was statistically significant.

Results

Table 1: Socio-demographic profile

Age in Yrs (Means ± SD)	54.21±10.65
Male : Female	72 : 38

In a total of 100 patients participated in our study 72 patients were male and 28 patients were females. This distribution shows the predominance of acute myocardial infarction among males. The mean age of patients was 54.21±10.65Yrs.

Table 2: Type of MI

Type of MI	No of patients
Anterior wall MI	59 (59.00%)
Inferior wall MI	41 (41.00%)

59.00% patients were anterior wall MI and 41.00% patients were inferior wall MI.

Table 3: WBC level

WBC	No of patients
>11000/mm^3	28 (28.00%)
<11000/mm^3	72 (72.00%)

28 patients had a WBC count above 1100/mm^3, an indication of leukocytosis. 72 patients had a WBC count below 11000 /mm^3.

Table 4: Association between WBC Counts and complications of acute myocardial infarction

Complications	WBC count <11000/mm^3 (n=72)	WBC count >11000/mm^3 (n=28)	Total	P-value
Left ventricular failure	6	9	15	0.029
Cardiogenic shock	4	7	11	0.03
In hospital mortality	2	5	7	0.041

Out of 100 patients 15 had LV dysfunction, among these 15 patients 9 were having elevated WBC count and 6 had normal WBC count. Among 100 patients 11 had cardiogenic shock, among these11 patients 7 had elevated WBC count and 4 had normal WBC count. Among 100 patients 7 patients died, among these 7 patients 5 patients had elevated WBC count and 2 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[4,5].

In our study, we found that Out of 100 patients 15 had LV dysfunction, among these 15 patients 9 were having elevated WBC count and 6 had normal WBC count. Among 100 patients 11 had cardiogenic shock, among these11 patients 7 had elevated WBC count and 4 had normal WBC count. Among 100 patients 7 patients died, among these 7 patients 5 patients had elevated WBC count and 2 patient had normal WBC count. 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, 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 at admission has a prognostic importance as independent and joint variables in predictors for short-term outcome in the form of in-hospital mortality in acute myocardial infarction cases.

References

1. Shahriari Ahmadi A, Amirfarhangi A, Gheisoori A, Arabi M, Mahmoudian AR, Payandeh M, Sadeghi M. The Prognostic Value of White Blood Cells Count in Patients with Myocardial Infarction. IJBC 2015; 7(5): 223-226.
2. Ishihara M, Kojima S, Sakamoto T, Asada Y, Kimura K, Miyazaki S, et al. Usefulness of combined white blood cell count and plasma glucose for predicting in-hospital outcomes after acute myocardial infarction. Am J Cardiol 2006;97:1558-63.
3. Agur AM, Dalley AF. Grants Atlas of Anatomy. 11th ed. Baltimore: Lippincott, Williams and Wilkins; 2005. p. 46-7, 52.
4. Lucchesi, B. R. (1990). Modulation of leukocytemediated myocardial reperfusion injury. Annual Review of Physiology, 52(1), 561-576.
5. Chatelain, P. A. S. C. A. L., Latour, J. G., Tran, D., De Lorgeril, M., Dupras, G., & Bourassa, M. (1987). Neutrophil accumulation in experimental myocardial infarcts: relation with extent of injury and effect of reperfusion. Circulation, 75(5), 1083-1090.
6. Friedman, G. D., Klatsky, A. L., & Siegelaub, A.B. (1974). Leukocyte count and myocardial infarction: correction. The New England journal of medicine, 291(25), 1361-1361.
7. Furman, M. I., Becker, R. C., Yarzebski, J., Savegeau, J., Gore, J. M., & Goldberg, R. J. (1996). Effect of elevated leukocyte count on in-hospital mortality following acute myocardial infarction. The American journal of cardiology, 78(8), 945-948.