Original Article

To Find Out the Role of C-Reactive Protein in Acute Myocardial Infarction as a Marker of Prognosis

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ABSTRACT

Objective: To find out the role of CRP in acute MI as a marker of prognosis.
Study Design: Cross sectional study
Place and Duration of Study: This study was conducted at the Medicine & Cardiology at Khyber Teaching Hospital Peshawar. Duration: March 2021 to February 2022.
Materials and Methods: Selection of subjects was done according to the inclusion and exclusion criteria followed by diving them into two cohorts; Acute MI patients that developed complications (Group I N=30) and a second group that didn't develop complications post MI during the hospital stay (Group II N=34). Blood for CRP Levels was taken and analysed at the Hospital Lab. The data was analysed using SPSS version 26.0 for MacBook Pro and organised as tables.
Results: CRP levels showed statistical significance ($p<0.05$) for both groups, with higher values for group I (5.14 mg/L ± 2.16mg/L) in comparison with group II (1.09 mg/L ± 0.96mg/L) subjects.
Conclusion: Our study found a direct relation between CRP levels and post MI complications and hence is a good prognostic marker in acute MI. The higher levels of CRP in group I show that raised CRP levels post MI are associated with the complications during hospital stay.

Key Words: Myocardial Infarction, C-Reactive Protein, Biomarker

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INTRODUCTION

Acute Myocardial Infarction (MI) constitutes a huge burden of the overall mortality and morbidity worldwide.[1] This implies that it is a public health concern of serious and growing nature.[2] The pathophysiology behind the development of MI is atherosclerotic changes in the coronary vessels.[3] C-Reactive Protein (CRP) is an inflammatory marker and inflammation plays a pivotal role in the etiology and pathogenesis of atherosclerosis.[4]
Studies have found out the role of CRP as an marker of risk prediction in MI and other cardiovascular events.[5,6]
It has also been found from studies that CRP has a role in assessing and predicting the risk for ischemic events and mortality for admitted patients.[7-9]

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CRP levels are detected nearly six hours after myocardial injury or an ischemic event (MI).[10] This elevation in their serum concentration has been associated with poor outcomes and bad prognosis in cardiovascular events.[11-12] It is also found to be a predictor for future risk assessment of MI.[13,14]
In this research study we have checked to find out the role of CRP in acute MI as a marker of prognosis by studying the various cohorts under examination and the development of complications is assessed for the patients that presented to our hospital.

MATERIALS AND METHODS

Our cross sectional (descriptive) study was carried out in the Dept. of Medicine & Cardiology at Khyber Teaching Hospital Peshawar. Duration: March 2021 to February 2022. Selection of subjects was done according to the inclusion and exclusion criteria followed by diving them into two cohorts; Acute MI patients that developed complications (Group I N=30) and a second group that didn't develop complications post MI during the hospital stay (Group II N=34).
Patients from both the genders with diagnosed acute MI (diagnosis made by consultant keeping both clinical and haematological values of the variables in account) were included in the study. Subjects with suspected acute MI or co morbid such as kidney disease, secondary

hypertension, thyroid, liver or parathyroid related medical conditions were excluded.

Blood for CRP Levels was taken and analysed at the Hospital Lab. The data was analysed using SPSS version 26.0 for MacBook Pro and organised as tables.

RESULTS

A total of sixty-four study participants were recruited in both groups, 28 males and 36 females. Group I had 30 subjects out of which 14 were females and the rest 16 were males. While in group II out of the 34 subjects 20 were females and the remaining 14 were males.

The mean and Standard Deviation (SD) for age showed 39 ± 4.1 years for males in both the groups combined. Females in both the groups had mean and SD of 42 ± 3.2 years.

CRP levels showed statistical significance ($p<0.05$) for both groups, with higher values for group I (5.14 mg/L ± 2.16mg/L) in comparison with group II (1.09 mg/L ± 0.96mg/L) subjects.

Table No. 1: Shows results of serum CRP Level in both the study groups

C-Reactive Protein	Group I (N=30)	Group II (N=34)	p Value
CRP Level (mg/L)	5.14 mg/L ± 2.16mg/L	1.09 mg/L ± 0.96mg/L	0.01

Data shows mean ± standard deviation (SD)**.**

DISCUSSION

Our study found a direct relation between CRP levels and post MI complications and hence is a good prognostic marker in acute MI.[15] However, our study does have a few limitations given the cross sectional, study design and nature of our research.

It is important that subjects included in the group I showed a significantly raised CRP level in contrast to subjects included in group II, this all given the fact that all the study subjects had an acute episode of MI. Table 1. Also, interesting is the fact where the study participants of group I developed complications post MI during their hospital stay. Hence, it can easily be deduced that the higher levels of CRP in group I show that raised CRP levels post MI are associated with the complications during hospital stay (in contrast to group II). The findings are in corroboration to the results of a couple of other studies.[16,17]

Overall, there were more females than males but when divided into groups this situation was contrasting for both groups. This is in contrast to the results of another study conducted by Khan ZA et al.[18]

Many studies have documented the elevation of these acute phase proteins in angina and ischemic events but the prognostic importance of CRP hasn't been under clear discussion.

The results of our study have vital pathophysiological significance in medical literature including the role of CRP in predicting the post MI prognosis and the absolute outcomes that maybe linked with it.

The current study has a lot of clinical significance and implications for the following obvious reasons. It was established for the first time in our study population an explicit relationship exists between acute MI and CRP as a marker of prognosis. The fairly large sample size of our study also adds strength and value to our findings and adds quality to the study. Another epidemiological strength would be the well-established inclusion and exclusion criteria.

CONCLUSION

Our study found a direct relation between CRP levels and post MI complications and hence is a good prognostic marker in acute MI. The higher levels of CRP in group I show that raised CRP levels post MI are associated with the complications during hospital stay. It is also pertinent to carry out further large-scale studies on bigger populations to have a better understanding of the subject and get results that could be generalised.

Author's Contribution:

Concept & Design of Study:	Mudassar Khan
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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