

A study on serum high sensitivity C - reactive protein in acute myocardial infarction

Karpagavel L

Associate Professor, Department of Biochemistry, Madha Medical College & Research Institute, Thandalam, Chennai 600122, Tamil Nadu, INDIA.

Email: karpag@yahoo.com

Abstract

C - reactive protein is a substance that is present in the sera of acutely ill patients and that is able to bind to somatic C-polysaccharide on the cell wall of streptococcus pneumonia. Development of assays capable of accurate measurement of CRP with concentration as low as 0.5mg/L are referred to as High-Sensitivity CRP (hs-CRP) assays. The purpose of the study is to find out a novel inflammatory marker in acute myocardial infarction. **AIM:** To correlate between elevation of serum hs-CRP and the occurrence of Acute Myocardial infarction (AMI). **Materials and Methodology:** Serum levels of hs-CRP was measured in blood samples collected within 6-12 hrs after the onset of chest pain in AMI patients and it was compared to serum hs-CRP levels in control group. Estimation of serum hs-CRP was done by immunoturbidimetric assay in Random access analyzer. **Result and Discussion:** Serum hs-CRP was estimated both in the control and the cases as mentioned and the results were analyzed. The mean level of hs-CRP in the control group was 0.9mg/L with a standard deviation of +/-0.46 and in AMI the mean was 8.20mg/L with a standard deviation of +/- 2.09. The study is statically highly significant with a p value of 0.001 and it proves hs-CRP to be a definitive diagnostic marker of AMI along with other known cardiac biomarkers like CK-MB. **Summary and conclusion:** Present study reveals that hs-CRP levels are higher within 6-12 hrs of onset of chest pain in AMI and hence hs-CRP is a promising novel inflammatory biochemical marker of Acute Myocardial Infarction.

Keywords: AMI (Acute Myocardial infarction), CK-MB (Creatine kinase-MB Isoenzyme), CRP (C - reactive protein), hs-CRP (High sensitivity C-reactive protein)

Address for Correspondence:

Dr. Karpagavel L, Associate Professor, Department of Biochemistry, Madha Medical College & Research Institute, Thandalam, Chennai 600122, Tamil Nadu, INDIA.

Email: karpag@yahoo.com

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INTRODUCTION

Acute Myocardial Infarction, even in present days hold the first place for the highest mortality and studies have proved that atherosclerosis is not simply a disease of lipid deposition but local and systemic inflammation play a pivotal role in atherothrombotic inception and progression. This fact generated a great deal of interest in

identifying inflammatory markers which may be detected early and easily in blood and could reflect the state of underlying inflammation. C-reactive protein, a well-known marker of systemic inflammation and infection received much attention after the development of high sensitivity assays. In the study of Doggen *et al* and in the study of Dedobbeleer hs-CRP is associated with significant increase in the occurrence of Acute Myocardial Infarction.

AIM

To correlate between the elevation of high sensitivity C-reactivity protein (hs-CRP) and the occurrence of Acute Myocardial Infarction.

MATERIALS AND METHODS

Study population comprised of hundred of which 50 were healthy controls and remaining 50 were patients with Acute Myocardial Infarction diagnosed by H/O

characteristic chest pain, ECG changes and other known cardiac bio marker like CK-MB. Patients who were critically ill, who underwent recent surgical procedures, who had recent infectious disease and others with concomitant systemic diseases like Rheumatic disease, chronic liver disease, renal disorders, cancer and sepsis were excluded. Blood samples were collected both from

the healthy controls and from patients with Acute Myocardial Infarction within 6-12 hours of the onset of chest pain after getting informed consent from them. Sample was estimated for (hs-CRP) by Immunoturbidimetric assay in a Fully Automated Random Access Chemistry Analyzer.

RESULTS

MEAN AND STANDARD DEVIATION OF hs-CRP IN CONTROLS AND CASES

Measurement of hs-CRP done by Immunoturbidimetric Method

Parameter	Controls mg/dl	Cases mg/dl	p value
hs-CRP	0.9+/-0.46	8.20+/-2.09	0.001

MEAN AND STANDARD DEVIATION OF CK-MB IN CONTROLS AND CASES

Measurement of Creatine kinase-MB done by UV-Kinetic Method

Parameter	Controls IU/L	Cases IU/L	p value
CK-MB	5.79	129.02	0.001

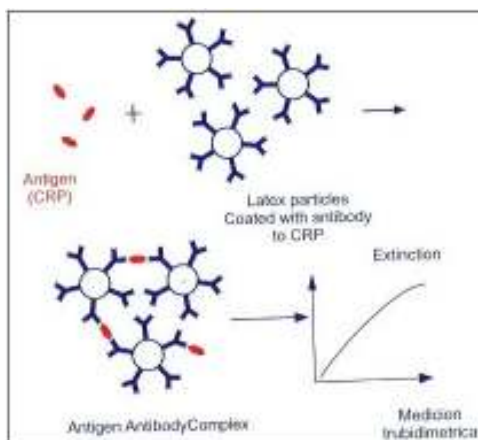


Figure 1: Immunoturbidimetric Reaction

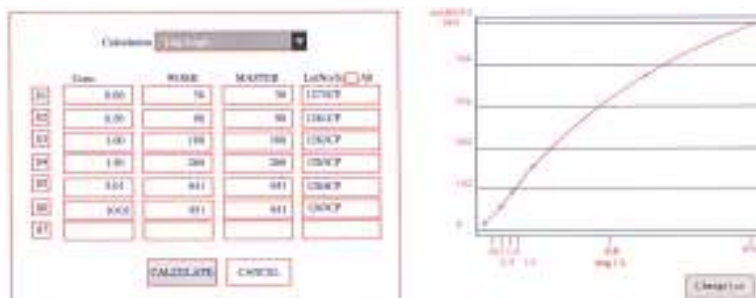


Figure 2: Standard graph of high sensitivity C-Reactive Protein

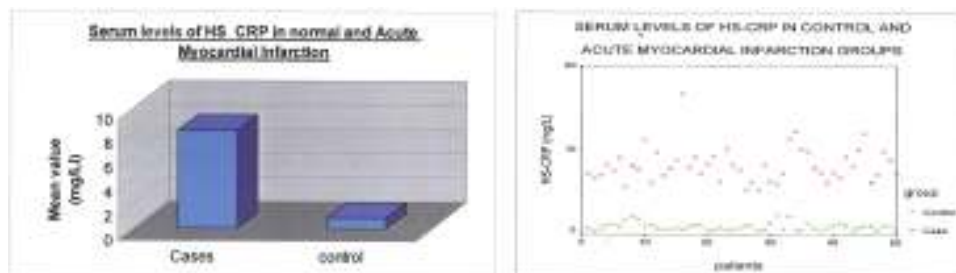


Figure 3

DISCUSSION

Serum hs-CRP was estimated both in the control and the cases as mentioned and the results were analyzed. The mean value of CK-MB in control group and AMI patients were 5.79IU/L and 129.02 respectively. In AMI the mean level of hs-CRP was high (8.20mg/L with a standard deviation of ± 2.09) and the mean level of hs-CRP in the control group was 0.9mg/L with a standard deviation of ± 0.46 . In AMI significant increase in hs-CRP was noticed which correlates with the study by Doggen *et al*, study of Liang *et al*, Study of Anderson *et al*, study of Dedobbeleer *et al*. Hence this study indicates the additive value of hs-CRP measurement as a marker in acute myocardial infarction along with known cardiac biomarkers like CK-MB. The study is also statistically highly significant with a p value of 0.001 and it proves hs-CRP to be a definitive diagnostic marker of AMI.

CONCLUSION

This study clearly shows that levels of hs-CRP are higher within 6-12 hrs of onset of chest pain in acute myocardial infarction and also proves hs-CRP to be a definitive diagnostic biochemical marker of Acute Myocardial Infarction along with other cardiac biomarkers like CK-MB. The study has generated the scope to relate serum

levels of other inflammatory markers like IL-6 to the occurrence of Acute Myocardial Infarction.

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