Original Article

A comparative study on serum high sensitivity C-reactive protein and serum Creatinine Kinase (Total-CK) in acute myocardial infarction

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Abstract

Introduction: 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. Serum Creatinine Kinase (Total-CK) is an enzyme expressed by various tissues including Cardiac tissue and can be easily measured in the serum of Acute Myocardial Infarction patients. The purpose of the study is to compare and correlate the serum levels of High Sensitivity C-Reactive protein and Serum Creatinine Kinase (Total-CK) in Acute Myocardial Infarction. **Aim:** To Compare and Correlate between the elevation of Serum hs-CRP and the elevation of Serum Creatinine Kinase (Total-CK) in Acute Myocardial infarction (AMI). **Materials and Methodology:** Serum levels of hs-CRP and Total - CK were measured and compared in blood samples collected within 6-12 hrs after the onset of chest pain in AMI patients. Estimation of serum hs-CRP was done by Immunoturbidimetric assay in Random access analyzer. Estimation of Creatinine Kinase (Total-CK) was done by UV kinetic method in Random access analyzer. **Result and Discussion:** Serum hs-CRP and Serum Total-CK were estimated in Acute Myocardial Infarction and the results were analyzed. The mean level of hs-CRP in AMI was 8.20mg/L with a standard deviation of +/-2.O9 and the mean level of Total-CK in AMI was1656.52 U/L with a standard deviation of +/ 446.29.The study is statiscally highly significant with a p value of 0.001and it proves hs-CRP to be a definitive diagnostic inflammatory marker of AMI along with other known cardiac enzyme markers like Total-CK. **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 marker of Acute Myocardial Infarction along with other known cardiac enzyme markers like Creatinine Kinase (Total-CK)

Keywords: Acute Myocardial Infarction, Creatinine Kinase (Total-CK), High Sensitivity C-reactive Protein.

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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. Creatinine Kinase (Total-CK) is a polypeptide dimer molecule with a molecular weight of 80,000 present in the cytoplasm. It is an enzyme present significantly in the Cardiac tissue and it is known to be elevated in the serum of Acute Myocardial Infarction

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patients. The purpose of the study is to compare and correlate the known cardiac enzyme marker Serum Total –CK with the inflammatory marker hs-CRP.

MATERIALS AND METHODS

Study population comprised of 50 patients with Acute Myocardial Infarction diagnosed by H/O characteristic chest pain and ECG changes. 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, sepsis, rhabdomyolysis, muscular dystrophies and myositis were excluded. Blood samples were collected from patients with Acute Myocardial Infarction within 6-12hours of the onset of chest pain after getting informed consent from them. Estimation of serum hs-CRP was done by Immunoturbidimetric assay in Random access analyzer. Estimation of serum Total-CK was done by UV kinetic method in a Random access analyzer.

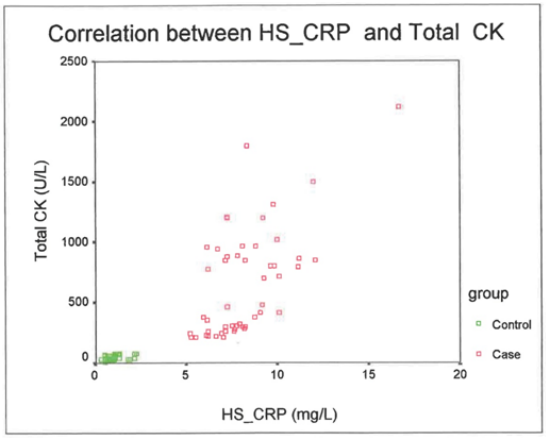
RESULTS

Table 1: Mean value of hs-CRP in cases
(Measurement of hs-CRP done by Immunoturbidimetric Method)

Parameter	Cases mg/dl
hs-CRP	8.20+/-2.O9

Table 2: Mean value of CK (total) in cases
(Measurement of CK (total) done by UV kinetic Method)

Parameter	Cases IU/L
CK(TOTAL)	656+/-446.29



DISCUSSION

Serum hs-CRP and Total CK were estimated in Acute Myocardial Infarction cases as mentioned and the results were analyzed. The mean value of Serum Total-CK in AMI patients was 656+/-446.29 and the mean level of hs-CRP in AMI patients was 8.20mg/L+/-2.O9. In AMI significant increase in hs-CRP was noticed along with concomitant increase in Total CK which correlates with the study by Doggen *et al*, study of liang *et al*. Hence this study indicates the additive value of hs-CRP measurement as an inflammatory marker in acute myocardial infarction along with known cardiac enzyme markers like Total CK. The study is also statistically highly significant with a p value of 0.001and it proves hs-CRP to be a definitive diagnostic marker of AMI along with known cardiac marker like Total CK.

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 inflammatory marker of Acute Myocardial Infarction along with other cardiac biomarkers like Total CK. The study has generated the scope to relate serum levels of hs-CRP with the serum levels of other known cardiac markers like CK-MB, LDH,AST in Acute Myocardial Infarction.

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