Comparative Study for Diagnosing Myocardial Damage with Cardiac Enzymes on Myocardial Infarction Patients and Normal Subjects

Abstract: Researches have demonstrated that cardiac troponin I and cardiac troponin T have similar usefulness for detection of acute myocardial infarction, as compared with creatine kinase-MB, suggesting could replace creatine kinase-MB in the detections of acute myocardial infarction. The validity of the test results can be checked with positive and negative controls provided in the kit. The main aim of this study is to monitor the cell or tissue damage by measuring the altered enzyme level also to prove the relationship between the altered enzyme level and degree of cell or tissue damage among different age group and male and female. The samples were collected in Community Health Centre at Acharapakkam with sample size of 30 patients age between 30-50 years and 50-70 yrs. In each experimental and control group 15 patients were selected. In this comparative study there is a significant increase in all the enzymes which denotes that there is a damage to the myocardial cells following myocardial infarction. Compared to male and female patients of myocardial infarction the cardiac enzymes are very significantly higher in male patients with myocardial infarction. Among the two age groups, in 50-70 years group the extent of myocardial damage is highly significant.

Keywords: Cardiac enzyme, Troponin T, Myocardial infarction, Myocardial damage.

INTRODUCTION

Millions of chest pain patients are admitted each year for ruling out myocardial infarction. More number of patients are admitted to the cardiac care unit (CCU) for suspected acute myocardial infarction (AMI), leading to heavy expenses that could be saved caring for these patients in a less intensive setting. The final WHO criterion involves monitoring the temporal change in biochemical markers of myocardial necrosis. In the past, enzyme activity was used as a marker; however, in the future, measurement of proteins, some of which are enzymes, will become the standard.

Cardiac Troponin-I: The ultimate breakthrough in biochemical markers. Cardiac Troponin I is an important prognostic variable in patients with unstable angina. Elevation of cardiac troponin I predict adverse short- and long-term prognosis. The rapid test for the estimation of cardiac troponin I in human serum is rapidly, immuno chromatography based test used for detection of elevated levels of cardiac troponin I. The total testing time is just 15 minutes.

MATERIALS AND METHODS

In order to find out the myocardial damage with cardiac enzymes on myocardial infarction patients and normal subjects experimental design was used and 30 samples were selected for this study. The samples were collected in Community Health Centre at Acharapakkam with sample size of 30 patients, age between 30-50 years and 50-70 yrs. In each experimental and control group 15 patients were selected. The blood samples obtained by various arm puncture are collected in a heparinized tube. Then the blood was subjected to centrifugation at 3000 RPM for 10 minutes to separate the serum. Plasma was stored in sample vial and used for analysis. Parameters used for Myocardial damage are Troponin I, Creatine kinase MB, Glutamate oxaloacetate transaminase and Lactate dehydrogenase.

RESULTS AND DISCUSSION

Table No.1 The level of creatine kinase MB, serum glutamate oxaloacetate transaminase, Lactate dehydrogenase and Troponin I in normal and acute Myocardial Infarction patients of male age between 30-50 years and 50-70 years. Among these two age groups, in 50-70 years group the extent of myocardial damage is highly significant.
Table No.2 The level of creatine kinase MB, serum glutamate oxaloacetate transaminase, Lactate dehydrogenase and Troponin I in normal and acute Myocardial Infarction patients of male and female. Compared to male and female patients of myocardial infarction the cardiac enzymes are very significantly higher in male patients with myocardial infarction.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Parameters</th>
<th>Female patient (Mean + SD)</th>
<th>Male patient (Mean + SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Creatine Kinase MB</td>
<td>68.26+14.05</td>
<td>92.4+39.29</td>
</tr>
<tr>
<td>2</td>
<td>Serum glutamate oxaloacetate transaminase</td>
<td>87.12+16.03</td>
<td>202+50.87</td>
</tr>
<tr>
<td>3</td>
<td>Lactate Dehydrogenase</td>
<td>516.6+37.85</td>
<td>643.2+96.35</td>
</tr>
<tr>
<td>4</td>
<td>Troponin I</td>
<td>Positive</td>
<td>Positive</td>
</tr>
</tbody>
</table>
The collected data was analyzed using mean, standard deviation, percentage and inferential statistics. Present study emphasis the sensitivity of Creatine Kinase MB, Serum glutamate oxaloacetate transaminase, Lactate Dehydrogenase, Troponin I in identifying the myocardial damage and its extent in myocardial infarction patients compared with normal subjects. Troponin I enzyme show a sharp rise in initial phase of myocardial infarction. Compared to male and female patients of myocardial infarction the cardiac enzymes are very significantly higher in male patients with myocardial infarction. Among the two age groups, in 50-70 years group the extent of myocardial damage is highly significant.

REFERENCES AND NOTES
1. Cardiac Biomarkers in acute myocardial infarction - International journal of cardiology, Sally J Aldous
14. Christenson, E., & Christenson, R. H. (2013). The role of cardiac biomarkers in the diagnosis and management of patients presenting with suspected...


28. Role and importance of biochemical markers in clinical cardiology - European heart journal *Mauro Panteghini*.


