

Serum Copeptin - A Diagnostic marker of Acute Myocardial Infarction

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Abstract

The Present study aim is to measure the level of Copeptin in serum of acute myocardial infarction patients and to correlate it with serum CK-MB level. S. Copeptin and S.CK-MB level was estimated in 60 cases of AMI and 60 controls. Mean \pm SD of S. Copeptin in Cases and control were (70.2 \pm 36.4) and (40.1 \pm 15.2). Mean \pm SD of S.CK-MB in cases and control were (22.0 \pm 9.7) and (8.6 \pm 2.8). S. Copeptin and S.CK-MB levels were significantly increased in cases compared to controls. Pearson's correlation between S. Copeptin and S.CK-MB found to be statistically significant (P<0.0001). Hence estimation of S. Copeptin can be used as diagnostic marker of AMI.

Keywords: Coronary artery diseases, Biomarkers.

1. Introduction

Acute myocardial infarction is a well known etiology for morbidity and mortality in the world wide [1]. Early and rapid diagnosis of acute myocardial infarction is required for proper management and prevention of complications [2].

The most common cause of myocardial infarction is atherosclerosis. The pathogenesis of atherosclerosis starts with the formation of atherosclerotic plaque. Atheromatous plaques consist of lipid laden macrophages or foam cells with oxidized LDL [3-5]. The tissue factor of macrophages activates the thrombocytes, leading to formation of a thrombus [6].

Though cardiac biomarkers like cardiac troponin, CK-MB are available, they are released only after occurrence of myocardial infarction. Hence we are in need of an early diagnostic marker of AMI.

Recently Copeptin, a new biomarker of acute endogenous stress is tested [7]. Copeptin is a C terminal part of pro Arginine Vasopressin (AVP).

The present study evaluates the serum levels of copeptin as an early diagnostic marker in AMI.

2. Materials and methods

The study was conducted in Tagore Medical College and Hospital. This was an age and sex matched study conducted on 60 cases of AMI and 60 control. Patients with complaints of chest pain within 4 hrs of onset showing Electro cardiographic findings like ST segment elevation or depression or T wave inversion were included in the study. Patients with any liver disease, lung disease and stroke were excluded from the study.

Serum Copeptin, serum Creatine Kinase-MB were estimated in both control and cases.

3. Results

Student's t test was used to compare cases and control. Comparison of S. Copeptin level between cases and control showed significant P value (P<0.0001). Also S.CK-MB level between cases and control was significant (P<0.0001).

Pearson's correlation analysis showed significant correlation between serum copeptin and serum CK-MB.

4. Discussion

Many novel biomarkers with more sensitivity and specificity which facilitates the management of Coronary artery disease has been identified [8-10]. Established biomarkers in acute coronary syndrome includes Troponin I, Troponin T, Brain Natriuretic Peptide,

N-Terminal Pro-BNP, C-Reactive Protein, Cystatin C, Heart-Fatty acid Binding Protein [11,12]. Though many biomarkers available, it is the serum levels of Copeptin that increases in most of the patients within 0 to 4 hours of onset of chest pain. The level increases even before the increase of troponin T. This was demonstrated by Reichlin and muller [13].

Both Arginine Vasopressin and Copeptin are stored in the neuro hypophyseal vesicles. During stress, both are released in equimolar quantity into the blood [2,13,14].

Elevation of serum copeptin level within 0 to 4 hours after onset of chest pain helps to diagnose AMI, before the onset of myocardial necrosis and is well correlated with serum CK-MB levels also. Creatine kinase is a muscle enzyme with three isoforms among which CK-MB level in the serum will be elevated after 3 hours of onset of chest pain [15].

Measuring Serum Copeptin along with ECG and other markers improves the diagnostic sensitivity of the method. Hence S. Copeptin can be used as an early diagnostic marker in AMI.

Table 1: Serum Copeptin level

Serum Copeptin level (t-test)	
S.Copeptin (ng/dl)	Mean \pm SD
Cases	70.2 \pm 36.4
Control	40.1 \pm 15.2

Table 2: Serum CK-MB level

Serum CK-MB level (t-test)	
S.CK-MB (U/L)	Mean \pm SD
Cases	22.0 \pm 9.7
Control	8.6 \pm 2.8

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