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RESEARCH ARTICLE

ASSOCIATION OF BIOCHEMICAL TESTS CARDIAC ENZYME WITH MYOCARDIAL INFARCTION IN EMERGENCY HOSPITAL ERBIL- IRAQ

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ABSTRACT

The relationship between biochemical tests and myocardial infarction has been studied. The study performed in 75 patients (45 males, 30 females) that had chest pain. The myocardial infarction tissue (MI) occurred in the locale of the hypoperfused myocardium. The whole blood taken from patients (3ml) was suffering from chest pain. Furthermore, the blood was estimated by Nano-Check in cardiovascular marker cTnl, CK-MB, and myoglobin. The patients revealed that had normal tests in spite of having chest pain. These results were taken in emergency hospital indicated that eleven patients hadpositive results, but other had negative results.

INTRODUCTION

At the point when a myocardial infarction happens in the hypoperfused district of the myocardium, oxygen can never again be provided to the cells in the locale. Cell passing is inevitable if oxygen isn't re-established in 10-15 minutes after the arrival of specific proteins from the inside cytoplasm into the bloodstream. Several proteins are restricted to and prevalent in the heart muscle cells; they can work as cardiovascular markers and be distinguished in the blood examples of AMI patients by particular immunoassays (M. Panteghini *et al,* 1999, FS. Apple 1992). Regrettably, none of the cardiac specificity, and a big lifetime in circulation. This situation has led to a panel method for the utilization of markers in patients with AMI. The ingredients of this cardiac panel must consist of a marker that unexpectedly increases after cardiac damage and exceptionally cardiac tissues specific. The mixture of nTnl, CK-MB and Myoglobin extensively used in panel assays meant for the dedication of AMI in the chest pain sufferers (H.B. Alan *et al,* 1999). Troponin is a contractile regularity protein complex determined in the skeletal and cardiac muscle. The Troponin complex consists of three different polypeptide components, troponin-I (Tnl), troponin T (TnT), and troponin C (TnC) and plays a crucial position in the transmission of the intracellular calcium sign actinmyosinm, which interaction (JP. Mehegan and LS. Tobacman 1991).

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TnC of cardiac tissues is same as that in skeletal tissues, but Tnl ad TnT of cardiac isoforms are special to these of skeletal isoform which allow the improvement of cardiac unique antibodies (GS. Bodor *et al,* 1992). Moreover, the cTnl level will become expanded by the blood as an end result of myocardial infarction (JE. Adam *et al,* 1994). Studies on the release kinetics point out that cTnl is now not an early marker of myocardial necrosis. It seems in serum 3-6 hours after symptom onset, similar to the release of CK-MB, However, cTnl remains elevated for 4-9 days post- AMI (J. Mair *et al,*1995, J. Mair *et al,* 1996). In addition to its utility in diagnosis, multiplied cTnl levels convey prognostic data and has been shown two to perceive patients having an increased risk of death (EM. Antman *et al,*1996). Troponin is a contractile consistency protein complex decided in the skeletal and cardiovascular muscle. The Troponin complex comprises of three distinctive polypeptide parts, troponin-I (Tnl), troponin T (dynamite), and troponin C (TnC) and plays a vital position in the transmission of the intracellular calcium sign actinmyosinm, which communication (JP. Mehegan and LS. Tobacman 1991). TnC of heart tissues is same as that in skeletal tissues, yet Tnl advertisement dynamite of cardiovascular isoforms are extraordinary to these of skeletal isoform, which permit the change of heart remarkable antibodies. In addition, the cTnl level will wind up extended in the blood as a final product of myocardial infarction (JE. Adam *et al,* 1993, JE. Adams *et al,* 1994). A Concentrates on the discharge energy call attention to that cTnl is presently not an early marker of myocardial putrefaction. It appears in serum 3-6 hours after indication beginning, like the arrival of CK-MB, In any case, cTnl stays hoisted for 4-9 days post-AMI (J. Mair *et al,* 1995, J. Mair *et al,* 1996). Notwithstanding its

utility in determination, duplicated cTnl levels pass on prognostic information and have been indicated two to see patients having an expanded danger of death (EM. Antman *et al,* 1996). CK (Creatine Kinase) is current in most tissues and is in specific involved with ATP regeneration. The enzyme is dimeric and exists as three isozymes, MM muscle, MB hybrid, and BB talent (D. Neumeier 1981). The MB isozyme has its best cognizance in the coronary heart muscle, subsequently, its stage in the serum has diagnostic value. The CK-MB level in day-to-day serum is less than 5 ng/ml. In cases of simple AMI, CK-MB level will emerge as accelerated internal 4-8 hours after the onset of chest pain, engaging in a peak between 12-24 hours and then drops down to ordinary with the resource of forty-eight hours. The pinnacle stage of CK-MB is 21 ng/ml or greater (JA. Lott 1984, B. Guibis *et al,* 1990). CK-MB has been viewed the gold accepted for the prognosis of AMI due to the fact of its cardio-specificity. However, CK-MB is now not an ideal marker to use on my personal due to the truth its stage dose now not amplify early enough to make a quick evaluation and might additionally also be elevated in one-of-a-kind condition. Although CK-MB greater focused in the myocardium (approximately 15% of the whole CK), it is moreover in skeletal muscle. False-positive elevations take place in an of clinical settings, trauma, heavy exertion, myopathies(M. Ruppert and H. R. Van 2001, CM. Schneider *et al,* 1995).

Myoglobin, a gas (oxygen) binding protoheme supermolecule exist within the muscle tissue, together with internal organ, skeletal and sleek muscle, has attracted tidy interest as an early marker of MI (AH. Wu 1997, C. Montague 1995). The injury to any of those muscles, hemoprotein seems within the blood faster than a different marker (H.B. Alan 1999). Levels could also be increased as early in concert hour following the onset of hurting once CK-MB levels square measure still within the vary of rang (normal)(AH. Wu 1997, P. Carraro *et al,* 1994, A. Clerico *et al,* 1993). This speedy look is due to the placement of hemoprotein within the cell and its low relative molecular mass. hemoprotein usually elevates two-four hours when the onset of an infraction, peaks at six-twelve hours and returns to normal inside twenty-four – thirty-six hours. Usually, the extent of myoglobin in liquid body substance is thirty-eighty ng/ml. In patients with MI, the extent may increase or so ten times on top of the limit of normal. Hemoprotein exhibits a high clinical sensitivity for AMI however poor specificity (M. Panteghini 1999, FS. Apple *et al,* 1990). Several studies recommend that hemoprotein could also be an honest screening assay in emergency rooms for the first identification of AMI. However, elevated hemoprotein values ought to be cautiously understood if the patient has excretory organ pathology of musculus injury as a result of detection of hemoprotein in a very patient suspected of AMI might have to be supplemented by the presence of a lot of definitive internal organ marker. However, a negative lead to a patient admitted inside two- nine hours when the onset of hurting might facilitate in ruling out AMI.

METHOD AND MATERIALS

The Nano-CheckTM AMI 3 in 1 test contain all the reagents necessary for the detection of cTnl, CK-MB and myoglobin in human whole blood, serum, and plasma. The strip coated with monoclonal mouse anti-CK-MB, anti-Myoglobin, and streptavidin on the test line, and dye pad infused with biotinylated monoclonal mouse anti-cTnl antibody and gold colloidal particles coupled with anti-CK-MM, anti-cTnl, and anti-myoglobin antibodies. Stabilizer containing 0.05% sodium azide and BSA protein is deposited in the dye pad in dried form. The nano - CheckTM test is containing a membrane strip in a sealed pouch with desiccant, instruction for use, a suitable pipette.

RESULTS

The samples of whole blood were taken around (3ml) transfer into anticoagulant tubes. Seventy-five tubes (45 males, 30 females) when the investigation of the patients suffering from chest pain. Measure the sample by apparatus of Nano-Checker 710 reader. When the whole blood was transferred by dropper into the strip after 15 minutes check a result. Eleven of the patients have the positive result of cTnl, CK-KB, Myoglobin but other patients have the negative result. The normal value of tests must be in range cTnl< 0.5 ng/ml, CK-MB< 5.0 ng/ml, myoglobin < 80 ng/ml. Table.1 Showed the standard deviation and mean values for patients had abnormal values. Table.1 showed the standard deviation and mean of 11 patients. Figure.1 showed the distribution of 11 patients, which had positive results (above the normal range) troponin, CK-MB, and Myoglobin. Figure 2 to 4 Showed the distribution of eleven patients with troponin, CK-MB and Myoglobin values which have positive results.

Table 1. Showed the number of patients, standard deviation and mean for troponin, CK-MB, Myoglobin

	No.	Troponin ng/ml	CK-MB ng/ml	Myoglobin ng/ml
SD	11	5.22	30.78	107.54
Mean	11	4.92	28.49	116.42

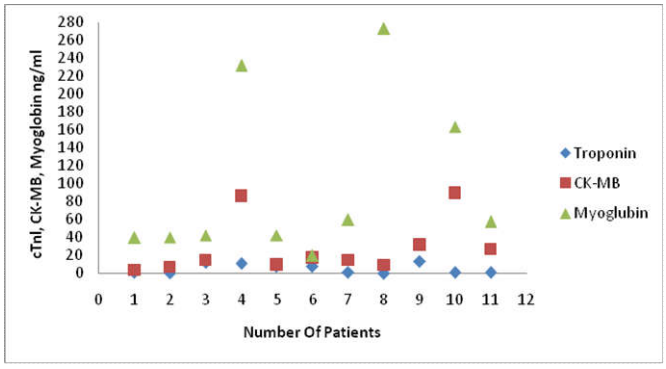

Figure1. Showed the distribution of eleven patients,which have positive results in troponin, CK-MB, and Myoglobin

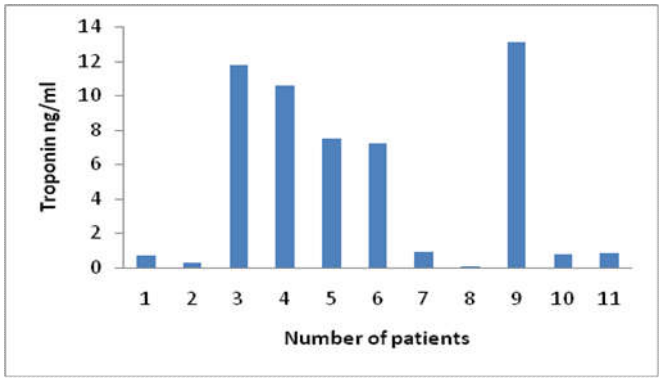

Figure 2. Showed the distribution of eleven patients with troponin values which have positive results

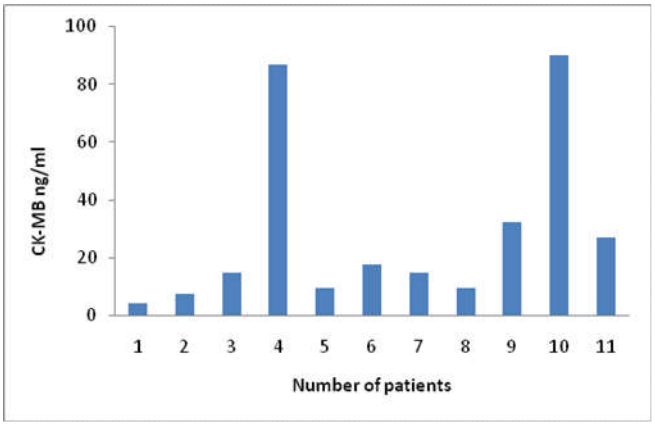

Figure 3. Showed the distribution of eleven patients with CK-MB values which have positive results

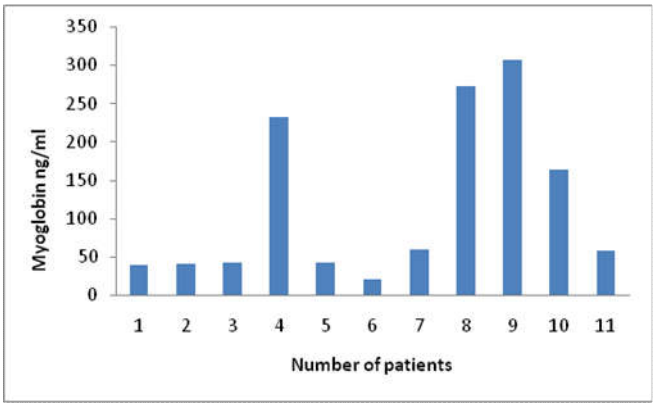

Figure 4. Showed the distribution of eleven patients with Myoglobin values which have positive results

DISCUSSION

The cardiac enzyme is a significant enzyme in the muscle of the heart. The Nano- Checker is testing the samples troponin, cardiac enzyme, and myoglobin. In this study was taken static analysis, among patients who suffering from chest pain in the province of Erbil- Iraq who is visiting the emergency hospital. The patients had a biochemical investigation of cardiac enzyme, the negative result indicates that had no problem with the heart muscle only may be stress caused a heart attack, but the positive result indicates that had myocardial infarction. In this study, we found that the patients had myocardial infarction, the elevation of creatine kinase within four-eight hours after that reaching to the normal range during twenty-four, thirty-six hours. In figure (2) showed that the troponin in the patients, which had positive results. Figure (3) and figure (4) showed positive values of CK-MB and myoglobin. This result indicated that patients may be suffering from heart failure or myocardial infarction. The sixty four patients had negative results only had chest pain. The negative result may be coming from stress. The standard deviation and mean were calculated. The results provided as the chest pain not indicated that patients suffering from myocardial infarction. The biochemical test of cardiac enzyme is a good monitor to check the heart muscle and prevent the patients from the risk of heart failure.

Conclusion

The study of biochemical investigations is crucial in medicine to diagnose the diseases. Specially cardiac enzyme is playing an important role to detect whether the heart muscle damaged or not. The men or women avoid myocardial infarction by doing physical activity. Also eating healthy food which lowering cholesterol and LDL. The aim of this study to show the patients who had myocardial infarction visiting the emergency hospital in Erbil- Iraq.

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