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A STUDY OF C-REACTIVE PROTEIN IN ACUTE MYOCARDIAL INFARCTION

Cardiology

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ABSTRACT

BACKGROUND: In Acute MI various biochemical substances rise in the serum .Study of C-Reactive protein is helpful not only in diagnosis but also in assessing the complications and efficacy of thrombolytic therapy in Acute myocardial Infarction Aim of the

STUDY :To assess the efficacy of thrombolysis in acute myocardial infarction after streptokinase injection with C-reactive protein estimation and to compare with clinical and ECG parameters.

MATERIALS AND METHOD: 50 patients admitted for Myocardial infarction in ICCU with typical chest pain and definitive ECG changes of ST segment elevation in at least two leads. Vital parameters were recorded. Serial ECG charges were followed in all patients. Blood sample drawn between 6 and 12hrs , 14 to30 hrs, 24to 30 hrs and 48-60 hrs after the onset of chest pain .Fifth Sample drawn at the end of one week. The sample was tested for C-reactive protein level by latex agglutination test. 20 patients who attended the outpatient department were kept as control.

RESULTS: Study population :50 . Age group: 30 to 76 yrs. Males:42 Females:8,AnteriorWall:34 Inferior Wall:16. Treatment with streptokinase:20. Male:17, Female:3. Anterior Wall:16 Inferior Wall:4. Efficacy of Thrombolytic therapy as assessed by relief of chest pain and reduction of ST segment elevation by 50% .C-reactive protein level started raising after 12 hrs in most of the patients.

CONCLUSION: C-Reactive protein level reaching its peak level at 48-60 hrs in patients who were not given streptokinase and returned to normal on 7th day in this study and hence useful in confirming the diagnosis of myocardial infarction. The fall in C-Reactive Protein Level from 24-30 hrs to the level at 48-60 hrs in patients with streptokinase showed higher sensitivity of thrombolytic efficacy than clinical and ECG parameters.

KEYWORDS

C reactive protein, Acute myocardial infarction, Thrombolysis

BACK GROUND:

Acute myocardial infarction is one of the most common diseases for which patients are admitted in Intensive coronary care units.Mortality with Acute Myocardial Infarction is approximately 30 percent, with more than half of deaths occuring before the patient reaches the hospital. Thus MI constitutes emergency requiring prompt hospitalisation.With the establishment of Intensive coronary care units, the mortality has come down, because of availability of various hemodynamic monitors, defibrillators and the presence of physicians in these coronary care units for 24 hours.Increased risk of death and another attack of myocardial infarction is there in patients who recover from the first episode of Acute Myocardial infarction.Myocardial ischaemia and necrosis occurs from subendocardial to subepicardial reginon.During necrosis various biochemical substances rise in the serum of such patients. C-Reactive protein, an acute reactant is raised in serum in Acute myocardial Infarction. Study of C-Reactive protein, an acute phase reactant is raised in serum in Acute myocardial Infarction. Study of C-Reactive protein is helpful not only in diagnosis but also in assessing the complications and efficacy of thrombolytic therapy in Acute myocardial Infarction This study is aimed towards such purpose. C-reactive protein named because it reacts as preciptin with the C-polysaccharide of the pneumococcus. Described originally as occurring in human serum in cases of pneumonia, it is found in any acute-phase response. The C substance is precipitated in the presence of C^{2+} by a B-globulin sometimes present in serum, CRP is detectable in blood during the acute phase of certain illnesses that are accompanied by inflammation and its level has been used as a measure of "activity" in diseases such as rheumatic fever. C-RP is produced in the liver. It rise strikingly seen whenever there is tissue necrosis. CRP has major significance as a highly sensitive acute phase reactant. Clinical measurement of C-RP is valuable as a screening test for organic disease and as a sensitive object index of disease activity and response to therapy in inflammatory, infective and ischaemic conditions. Serium C-reactive protein Normal value is less than 0.6mg/dL. In acute Myocardial Infarction CRP raises within 24 hours, begins to fall by the third day, and becomes normal after 1-2 weeks. Serum C-reactive protein rises in acute myocardial infarection, correlating positively with infarct size if thromobolytic treatment is not given. This correlation disappears if thrombolytic treatment is given, although the serum C-reactive protein concentration is still associated with the clinical outcome of the patients. CRP levels are also useful in clinical evaluation of such disorders as rheumatoid arthritis, systemic lupus erythematosus, vasculitic syndromes, inflammatory bowel disease, and myocardial infarction.

AIM OF THE STUDY: 1.To assess the efficacy of thrombolysis in acute myocardial infaretion after streptokinase by serially assessing the rise and fall of C-reactive protein and to compare with clinical and ECG parameters of thrombolytic efficacy.2.To assess C-reactive protein in the diagnosis of Acute myocardial infarction.

MATERIALS AND METHODS: Study Design: Case control study. Venue: Department of cardiology, Kilpauk medical college hospital,Chennai. Study group:20 control patients and 50 patients admitted for Myocardial infarction in ICCU with typical chest pain and definitive ECG changes of ST segment elevation more tha 0.1mV in at least two leads. Informed consent and ethical committee approval were obtained. The rise and fall of cardiac enzyme markers level were estimated History of chest pain , site, duration were noted. Vital parameters like pulse, BP , JVP , respiratory rate , Heart sounds and rales were recorded. Serial ECG charges were followed in all patients In those patients who were given SK relief of chest pain ,decrease in ST segment elevation by 50%, reperfusion arrhythmias such as ventricular premature depolarisations, accelerated idioventricular rhythm and sinus bradycardia were noted..Blood samples were drawn between 6 and 12hrs , 14 to30 hrs, 24to 30 hrs and 48-60 hrs after the onset of chest pain Fifth Sample drawn at the end of one week. The samples were tested for C-reactive protein level by latex agglutination test. CRP slide test for detection of CRP is based on principle of agglutination The serum is mixed with CRP latex reagent and allowed to react. If C-RP concentration is more than 0.6 mg/dl a visible agglutination is observed. 20 patients who attended with no history of chest pain the outpatient department were kept as control and CRP was estimated in these patients.

RESULTS: Study population : 20 patients age group between 37 and 73 attending cardiology outpatient department without recent history of chest pain were kept as controls and CRP values were less than 0.6mg/dl.50 inpatients . Age group: 30 to 76 yrs. Males:42, Females:8, Anterior wall infarction:34 , Inferior Wall infarction :16. Patients treated with streptokinase:20; Male:17, Female:3. Anterior Wall infarction 16 ;Inferior Wall infarction:4. Efficacy of Thrombolytic therapy was assessed by relief of chest pain and reduction of ST segment elevation by 50%. C-reactive protein level started raising after 12 hrs in most of the patients. Peak value:2.4 mg/dl to 19.2 mg/dl. Most of the values were between 4.8 mg to 9.6 mg/dl. In patients who

were not thrombolysed peak value was at 48-60 hrs (IVth sample) compared to those patients who were thrombolysed by streptokinase it reached its peak value at 24-30 hrs (III Sample)**.**In patients who were effectively thrombolysed the values started falling from 48-60 hrs onwards (IV Sample). C-reactive protein values returned to normal at the end of 1 week except in patients who developed Left Ventricular failure.

STATISTICAL ANALYSISA –

Those patients who were thrombolysed. B – These patients who were not thrombolysed patients with LVF excluded

	A.Thrombolytic Group			**B.Non Thrombolytic Group**			**Value**	**Value**
Sample	n (number)	X (mean)	S.D. (Standard deviation)	n (number)	X (mean)	S.D. (Standard deviation)	t-value	p-value
II	12	2.6	0.69	28	1.24	0.6	6.26	P<0.01
III	12	8	2.36	28	2.87	1.32	8.80	P<0.01
IV	12	3.1	1.32	28	6.17	2.48	4.08	P<0.01

Analysis showed significant difference between Groups A & B in II and IV samples, since p value is < 0.01 Sample at 24-30 hrs.In patients who were effectively thrombolysed, IV samples (at 48-60 hrs) showed lower values than in III samples (at 24-30 hrs).

DISCUSSION:

In acute myocardial infarction acute phase reactants are elevated. In this study C-reactive protein, showed elevations in serum level following acute myocardial infarction in all the patients with typical chest pain and typical serial ECG changes. In this study serum C-reactive protein was measured in 70 patients. Among this, 50 patients admitted with typical chest pain in ICCU were studied, 20 patients who attended the cardiology out patient department without any recent history of chest pain were taken for control study. In their study of C-reactive protein in myocardial infarction Pepys MB et al have shown that all individuals with infarction developed increased CRP levels. In this study effectiveness of thromobolysis as assessed by rise and fall of C-reactive protein is 60 percent, but the effectiveness as assessed by combination of relief of chest pain, decrease in ST segment elevation and Reperfusion arrhythmias is 15 percent only. This percentage could be increased if the patients arrive to hospital within three hours of onset of chest pain. In this study 20 patients received streptokinase, 12 patients (60%) were effectively thrombolysed. In those patients who were effectively thrombolysed the level of C-reactive protein fell from the value at 24-30 hrs (III sample) to the value at 45-60 hrs IVth sample.

CONCLUSION:

C-Reactive protein level was raised in acute myocardial infarction, reaching its peak level at 48-60 hrs in patients who were not given streptokinase and returned to normal on 7th day. Thus useful in confirming the diagnosis of myocardial infarction. The fall in C-Reactive Protein Level from 24-30 hrs to the level at 48-60 hrs in patients, who were given streptokinase showed higher sensitivity of thrombolytic efficacy than clinical and ECG parameters.

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