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The study of the relationship of C-reactive protein with ischaemic heart disease

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Abstract

Aim: To evaluate the serum concentration of CRP in IHD and its association with prognosis.

Material and Method: Diagnosis of the patients was made after thorough history and ECG and relevant laboratory investigations. The C reactive protein assay was performed the presence of agglutination indicates that the content of CRP in the sample equal to or greater than 0.6 mg/dl. Homogenous suspension of fluid (without agglutination) indicates a CRP level lower than 0.6 mg/dl. The detection limit of this test is 0.6 mg/dl. Therefore, values of less than 0.6mg/dl were taken as normal concentration of CRP. Values of more than 0.6 mg/dl were taken as elevated levels of CRP.

Results: Mean CRP values are significantly higher in AMI group as compared to unstable angina group, both on admission and after 48 hours. Chi Square value after 48 hours of admission found was 23.254 with P value of 0.006 which is statistically significant (< 0.05).

Conclusion: Higher the level of CRP value on admission and 48 hours more is the risk of complications and death. Hence CRP values help in risk stratification and predicting the prognosis.

Keywords: agglutination, serum concentration

Introduction

Higher Cardiovascular disease CVD rates will also have an economic impact. Even assuming no increase in CVD risk factors, most countries, but especially India and South Africa, will see a large number of people between 35 and 64 die of CVD over the next 30 years, as well as an increasing level of morbidity among middle-aged people related to heart disease and stroke [1, 2]. Despite declining age-adjusted rates of coronary death, cardiovascular mortality is on the rise due to the overall aging of the population. There is a powerful global trend toward increased atherosclerotic disease.

Enormous challenges remain regarding translation of the current evidence base into practice. We must learn how to help individuals adopt a healthy lifestyle and how to deploy our increasingly powerful pharmacologic tools most economically and effectively. The obstacles to implementation of current evidence-based prevention and treatment of atherosclerosis include economics, education, physician awareness, and patient adherence to recommended regimens. Future goals in the field of treatment of atherosclerosis should include more widespread implementation of the current evidence-based guidelines regarding risk-factor management and, when appropriate, drug therapy [1, 3].

Due to the irreversibility of most acute cardiac events there is always an interest in searching for simple tests to single out patients with bad prognosis, so that timely revascularization is planned or they are put on intensive conservative regimens [8]. This study is designed to evaluate the serum concentration of CRP in IHD and its association with prognosis.

Material and Method

The present study was carried out in the Department of Medicine, Krishna Hospital and Medical Research centre, Karad, during the period of June 2009 to December 2010. 100 patients of both sexes were studied. Study group included 25 cases of acute myocardial infarction and 25 cases of unstable angina from medical intensive care unit and 25 cases of stable angina from outpatient department (OPD). 25 healthy subjects were taken as control group.

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Serum C-reactive protein level estimation was carried out in the Department of microbiology. Serum CRP levels were estimated at the time of admission, after 48 hours in all patients of unstable angina and AMI group. CRP levels were estimated only once in control and stable angina groups. Prior informed consent was taken from the patients before the tests.

Diagnosis of the patients was made after thorough history and ECG and relevant laboratory investigations. The C reactive protein assay was performed the presence of agglutination indicates that the content of CRP in the sample equal to or greater than 0.6 mg/dl. Homogenous suspension of fluid (without agglutination) indicates a CRP level lower than 0.6 mg/dl. The detection limit of this test is 0.6 mg/dl. Therefore, values of less than 0.6mg/dl were taken as normal concentration of CRP. Values of more than 0.6 mg/dl were taken as elevated levels of CRP.

Results

In the present study 100 patients of both sexes were studied. Study group included 25 cases of acute myocardial infarction and 25 cases of unstable angina from medical intensive care unit and 25 cases of stable angina from outpatient department (OPD). 25 healthy subjects were taken as control group. Maximum incidence was observed in age group between 51 to 70 years, accounting for 66 (66%) patients. Youngest was 40 years old who suffered STEMI. Oldest was 83 years female, who had UA/NSTEMI in this study of the 100 patients we observed, 63 patients were males and 37 were female patients. There were 25 STEMI patients; of these 11 (44%) were males and 14 (56%) females. And of 25 UA/NSTEMI, 19 (64%) were from male and 6 (24%) were females.

On admission max (40%) patients had values 0.6 mg/dl. After 48 hours max. (24%) patients had value 1.2mg/dl and 3.0 mg/dl each.

Table 1: Distribution of C-reactive protein values in AMI group on admission and after 48 hours

CRP Values Mg/dl	On Admission		AT 48 Hours	
	N=25	%	N=25	%
0	02	8	0	0
0.6	06	24	0	0
1.2	06	24	01	4
2.4	06	24	05	20
3.0	03	12	01	4
3.6	01	4	-	-
4.2	01	4	01	4
4.8	-	-	03	12
7.2	-	-	06	24
9.6	-	-	08	32

Mean CRP values are significantly higher in AMI group as compared to unstable angina group, both on admission and after 48 hours. Chi Square value after 48 hours of admission found was 23.254 with P value of 0.006 which is statistically significant (< 0.05).

Discussion

In our study mean age of occurrence of Ischaemic heart disease is 58.21 years. In Foussas *et al.* [56] studies and Mohmoud Suleiman *et al.* [57] study mean age was seventh decade. And in Indian subcontinent coronary artery diseases occur a decade earlier than the western population. So, mean

age of our patients is comparable to above mentioned studies.

In this study of the 100 patients we observed, 63 patients were males and 37 female patients. There were 25 STEMI patients; of these 11 (44%) were males and 14 (56%) females. And of 25 UA/NSTEMI, 19 (64%) were from male and 6 (24%) were females.

Risk Factors

In our study smoking is one of the most common risk factor, found in 44% patients. In Foussas *et al.* [56] study, smoking was observed in 57% of patients. In Mohmoud Suleiman *et al.* [57] study, smoking was observed in 40% of patients. Salim Yusuf *et al.* [58] study, 65.19% of patients were smokers.

Table 2: Age wise distribution of subjects

Age in years	Number	Percentage%
40-50	24	24
51-60	33	33
61-70	33	33
71-80	08	8
81-90	02	2

Lipid Abnormalities

In our study dyslipidemia is the most common risk factor, found in 66% of patients, in our study 72% patients of AMI group and 60% patients of unstable angina group had lipid abnormalities.

In Foussas *et al.* [56] study 64.6% of patients had lipid abnormalities. In Mohmoud Suleiman *et al.* [57] study 41% of patients had dyslipidemias

Diabetes Mellitus

In our study 4 (16%) patients from AMI group and 5 (20%) from unstable angina group had diabetes as the risk factor.

In Foussas *et al.* [56] study Diabetes mellitus was seen in 31% of patients and Mohmoud Suleiman *et al.* [57] study diabetes was present in 30% of patients.

Hypertension

In our study 7 (28%) patients from AMI group and 14 (56%) from unstable angina group had hypertension. Hypertension was seen more frequently in Foussas *et al.* [56] study (51%) and Mohmoud Suleiman *et al.* [57] study (53%). In "INTER HEART" study by Prof. Salim Yusuf *et al.* [58], hypertension was seen in only 19.3% of patients, if only South Asian population is considered.

C Reactive Protein Levels

We have studied 100 patients including AMI group (n =25), unstable angina group (n = 25), stable angina group (n = 25) and Control group (n = 25). In this study 16 (64%) of patients from stable angina and 19 (76%) of patients in control group had undetectable values.

In unstable angina group

On admission max. (40%) patients had values 0.6 mg/dl After 48 hours max. (24%) patients had value 1.2mg/dl and 3.0 mg/dl each.

In AMI group

On admission max (24%) patients had value 1.2mg/dl and 0.6 mg/dl each. Value of 9.6 mg/dl observed in majority of

patients (32%). Patients who had developed complications were having positive CRP value (>0.6) on admission as well as significantly higher values after 48 hours.

Mean CRP values are significantly higher in AMI group (1.70 and 6.19) as compared to unstable angina group (1.24 and 2.90), both on admission and after 48 hours. Also mean CRP values in patients who developed complications is higher than that in patients who had no complications in AMI group.

Conclusion

In present study it can be concluded that:

1. C-reactive protein values rise significantly in unstable angina group and AMI group on admission, which usually elevate after 48 hours in spite of treatment.
2. There occurs no significant rise in CRP levels in unstable angina group and CRP levels are comparable to the control group.
3. Higher the level of CRP value on admission and 48 hours more is the risk of complications and death. Hence CRP values help in risk stratification and predicting the prognosis.

Conflict of interest: No conflict of interest

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