

## C-reactive protein in Cardio-Vascular Diseases

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### Abstract

In this study of 82 cardiovascular cases and 38 control cases admitted to the medical, surgical and pediatric wards of a general hospital in Pune, in the period Oct.1987 to Dec.1988, C-reactive protein levels were raised in the serum, in presence of myocardial necrosis due to infarction, rheumatic heart disease congestive cardiac failure and bacterial endocarditis, earlier than a rise in erythrocyte sedimentation rate and polymorphonuclear leucocytosis in peripheral blood. Hence it could be used as a prognostic indicator.

**KEYWORDS:**CRP, CVS, ESR, SGOT, CCF

**Introduction:** C-reactive protein(CRP), an acute phase reactant, is normally present in trace amounts in the blood of healthy individuals and increases in concentration in various inflammatory disorders and following tissue injury.

#### Aims and Objectives:

- 1) To detect evidence of activity in rheumatic heart disease, thus being a prognostic indicator.
- 2) To detect early endocarditis and pericarditis.
- 3) To detect early congestive cardiac failure (CCF) and evidence of a thromboembolic episode.
- 4) To differentiate between angina pectoris and acute myocardial infarction.
- 5) To compare the CRP levels in serum with erythrocyte sedimentation rate( ESR) & leucocyte counts in peripheral blood.
- 6) To correlate the changes in CRP levels in serum with other parameters viz. serum glutamate oxaloacetate transaminase(SGOT) levels, anti-streptolysin titres etc., with the clinical progress of the patient.

#### Materials and methods:

In the present study, 82 cases of CVS , 32 non- CVS(anaemia without CCF and protein energy malnutrition) cases and 6 healthy volunteers were tested for serum CRP (by latex agglutination method) qualitatively and quantitatively, at the time of admission, 1st week and 2 nd week . The CRP test results were compared with ESR

(Wintrobe tube method-Dacie & Lewis 1975) and leucocyte counts(as per standard method used by Dacie & Lewis 1984).

This study was carried out in the period Oct 1987 to Dec 1988.

The cases for the study were from those admitted in the medical, surgical & pediatric wards of a general hospital in Pune, Maharashtra, India..

**Sample population:** Age wise the youngest was 3 months old & the oldest was 80 yrs old.

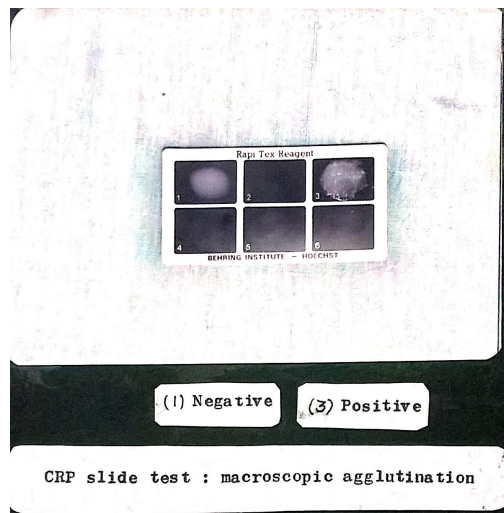
Sex wise there were 70 males and 50 females in the present study.

**PROCEDURE:** Blood samples were collected in plain & hemogram (EDTA) bulbs. Serum was separated and stored at 2-8 deg Centigrade with an additional drop of 0.1% sodium azide as preservative.

Sr CRP test was done by latex agglutination on 1:5 diluted(with saline) serum,

40 microlit. diluted serum+40microlit. latex reagent→Agglutination was seen macroscopically after 2 mins.This was interpreted as a positive result.

Positive and negative controls were put simultaneously. If positive result was obtained,test was repeated usng doubling dilutions to find out the endpoint. Highest dilution (1:80) was equivalent to a value of 96mg/lit. Normal values in adults was 5mg/lit.



**RESULTS:** The cases were grouped & the percentage of cases with elevated levels of CRP at initial testing were as follows:

Group	Elevated CRP levels(Cases)

Bacterial Endocarditis	87.5% (8 cases)
Ischaemic Heart Disease without CCF	41% (27 cases )
Rheumatic Heart Disease without CCF	40% ( 15 cases )
Congestive Cardiac Failure(CCF)	37% ( 19 cases )
<b>By Ist week</b>	
All the above four groups	35% ( 12 cases )
<b>By IInd week</b>	
All the above four groups	Normal (100%)( 82 cases)

DISCUSSION:

**TABLE I**

	<b>Sr CRP elevated</b>	<b>ESR raised</b>	<b>Leucocytosis</b>
<b>At Initial TESTING</b>	35%( 12 cases)	72.5%(87 cases)	30%(36 cases)
<b>I st WEEK</b>	35%( 12 cases)	44% (36cases)	27% (22 cases)
<b>II nd Week</b>	Normal	19.5% (16cases)	7%(6 cases)

**Table II**

<b>Acute Myocardial Infarction</b>	<b>Sr CRP elevated</b>	<b>Sr SGOT raised</b>
<b>At Initial TESTING</b>	58%(11cases)	89.5%(17cases)
<b>I st WEEK</b>	27% (3 cases)	27% (3 cases)
<b>II nd Week</b>	100% Normal	100% Normal
<b>In Angina Pectoris</b>	100% Normal	100% Normal (8cases)

**Table III**

In Rheumatic Heart Disease without CCF	Sr CRP elevated	Rising ASO Titres
<b>At Initial TESTING</b>	40%(6 cases)	40%(6 cases)

**CONCLUSIONS:**

From Table I – Sr CRP levels could be used as a good prognostic indicator in all types of cardiovascular diseases :

- as a reliable index of myocardial necrosis
- as an indicator of a thromboembolic episode in CCF.

However Sr.CRP levels were not helpful in the differential diagnosis of rheumatoid arthritis and infective endocarditis. Allergic drug reactions and intermittent infections could cause a transient rise in Sr CRP levels during the fall to normal limits by the II nd week.

False positives were seen with heavily lipemic sera, plasma and patients who had rheumatoid factor positivity. False negatives were seen due to a prozone effect of highly elevated Sr CRP levels.

**Advantages of Sr CRP level Testing:**

- 1) Only 0.05 ml serum was required.
- 2) Was easy to perform at bedside
- 3) Results could be obtained by 2 mins.

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