



## COMPARATIVE STUDY OF C-REACTIVE PROTEIN LEVEL IN RHEUMATOID ARTHRITIS (RA) AND CORONARY HEART DISEASE (CHD) PATIENTS AT TERTIARY CARE CENTRE KANPUR (U.P.)

### Biochemistry

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### ABSTRACT

C-reactive protein (CRP) is a phylogenetically highly conserved plasma protein that participate in the systemic response to inflammation. Its plasma concentration increases during inflammatory states, a characteristic that has long been employed for clinical purposes. CRP is a sensitive marker of systemic inflammation. CRP is believed to be both a marker and a mediator of atherosclerosis and Coronary Heart Diseases (CHD). In the present study, the CRP levels were studied in 122 patients of Rheumatoid Arthritis and 120 patients of Coronary Heart Diseases. The levels more than 0.6mg/dl were marked to be higher. For the detection of CRP in serum semi-quantitative method was used. It was found that CRP level is higher in age group B than age group A in RA and CRP level is higher in age group A than age group B in CHD. This shows that CRP level can differ according to age differences.

### KEYWORDS

C-Reactive Protein, inflammatory marker, Rheumatoid Arthritis, Coronary Heart Disease

### INTRODUCTION

**C-reactive protein (CRP)** is an acute-phase protein of hepatic origin that increases following interleukin-6 secretion by macrophages and T cells. CRP is synthesized by the liver [1] in response to factors released by macrophages and fat cells (adipocytes) [2]. It is a member of the pentraxin family of proteins [3]. It is not related to C-peptide (insulin) or protein C (blood coagulation). C-reactive protein was the first pattern recognition receptor (PRR) to be identified [4]. CRP is used mainly as a marker of inflammation. Apart from liver failure, there are few known factors that interfere with CRP production [5]. Interferon alpha inhibits CRP production from liver cells which may explain the relatively low levels of CRP found during viral infections compared to bacterial infections [6].

Histological studies conducted in patients with RA have demonstrated synovitis in joints without inflammation [7]. The more inflammation in the joints the higher the CRP. The CRP is a more sensitive measure of inflammation than the ESR. CRP seems to predict cardiovascular risk at least as well as cholesterol levels do. CRP levels are stable over long periods, have no diurnal variation, can be measured inexpensively with available, and have shown specificity in terms of predicting the risk of CHD [8]. The present study is conducted on patients of rheumatoid arthritis and coronary heart diseases. CRP levels are studied in the patients of both the diseases in different age groups of either sex.

### MATERIAL AND METHOD

It was a hospital based comparative study, conducted in Biochemistry department among 122 patients of Rheumatoid arthritis and 120 patients of Coronary heart Disease of different age groups attending the OPD of General Medicine of Rama Medical College hospital and Research Centre, Mandhana, Kanpur (U.P.). The study was conducted for the period of 1 year (November 2017 to October 2018). For the detection of CRP in serum semi-quantitative method is used, RHELAX-CRP kit was used which is a type of rapid latex agglutination test.

The collected data was consolidated in Excel sheets which was analysed using software **SPSS VERSION 21.0**  $p$ -value < 0.05 was considered statistically significant.

### RESULTS

#### 1. C-Reactive Protein Mean $\pm$ S.D. level and comparison in R.A. and CHD patients

**Table I**

Number Of Observation (N)	Mean	Standard Deviation	t value	p value	Mean difference
R.A. (N = 122)	1.934	0.840	2.192	0.030	0.348
CHD (N = 120)	2.282	0.903			

Table I shows the CRP levels (mg/dl) in both the diseases RA in CHD

patients. The Mean S.D. level in RA and CHD was  $1.934 \pm 0.840$  and  $2.282 \pm 0.903$  respectively. The  $p$ -value is 0.030. The result is significant at  $p < 0.05$

#### 2. CRP level and comparison in both the age groups of R.A. patients.

**Table II**

Number Of Observation (N)	Mean	Standard Deviation	t value	p value	Mean difference
Group A (N = 62)	1.764	0.821	1.632	0.108	0.346
Group B (N = 60)	2.11	0.837			

Table II shows the comparison in CRP levels (mg/dl) in both the groups. The Mean S.D. level in group A (20 – 40 years) and B (41 – 60 and above years) was 1.764 0.821 and 2.11 0.837 respectively. The result is not significant at  $p < 0.05$

#### 3. CRP level and comparison in both the age groups of CHD patients.

**Table III**

Number Of Observation (N)	Mean	Standard Deviation	t value	p value	Mean difference
Group A (N = 60)	2.293	0.935	0.099	0.921	0.233
Group B (N = 60)	2.27	0.886			

Table III shows the CRP levels (mg/dl) in both the groups in CHD patients. The Mean S.D. level in groups A and B was **2.293 0.935** and **2.27 0.886** respectively. The result is not significant at  $p < 0.05$

### DISCUSSION

In the present study, the CRP levels were studied in 122 patients of RA and 120 patients of CHD. The levels more than 0.6mg/dl were marked to be high [9] however, the patients with high level of CRP were included in the study.

Table I shows the CRP levels (mg/dl) in both the diseases R.A in CHD patients. The Mean S.D. level in R.A. (N = 122) and CHD (N = 120) was **1.934  $\pm$  0.840** and **2.282  $\pm$  0.903** respectively. The CRP level in the CHD is significantly higher than R.A. by mean difference of 0.348. Previously, **Michael J (2000) et. al** [10], **Wolfe F (1997)** [11], **Mallya RK (1982) et. al** [12], **R S Amos (1977) et. al** [13] found high level of CRP in rheumatoid arthritis patients. Whereas, previously **Wolfgang Koenig (1999) et. al** [14], **Nader Rifai (2001) et. al** [15], **Folsom AR (2002) et. al** [16] found significantly higher level of CRP in Coronary heart diseases and coronary artery diseases patients.

According to Table II the number of patients studied in two age groups A & B were 62 and 60 respectively in R.A. Previously also **H. Surekha Rani (2006) et. al** stated that CRP test was found to be positive in 69/75

cases of RA [17]. The Mean S.D. level in group A (20 – 40 years) and B (41 – 60 and above years) was **1.764 0.821** and **2.11 0.837** respectively. The CRP level in the group B is insignificantly higher than group A by mean difference of 0.346. Previously, **Nielen NM (2004) et.al** [18] done study on Seventy-nine patients. Table II and Graph II shows comparison of CRP levels between both the groups of R.A. The t-value is 1.632. The p-value is 0.108. The result is not significant at  $p < 0.05$ . The CRP level in group B is insignificantly higher than group A with the mean difference of 0.346. **Further studies need to be done regarding comparison of CRP level in both the age group wise.**

According to Table III the number of patients studied in two age groups A & B were 60 and 60 respectively in CHD. Previously **Pfützn A (2006) et.al** investigated CRP in the context of arteriosclerosis and subsequent vascular disorders [19]. The Mean S.D. level in groups A (20 – 40 years) and B (41 – 60 and above years) was **2.293 0.935** and **2.27 0.886** respectively. The CRP level in the group A is insignificantly higher than group B by mean difference of 0.023. Previously, **Wolfgang Koenig (1999) et.al** [14] examined the association of serum CRP with the incidence of first major CHD event in 936 men 45 to 64 years of age. The t-value is 0.099. The p-value is 0.921. The result is not significant at  $p < 0.05$ . The CRP level in group A is insignificantly higher than group B with the mean difference of 0.233. **Further studies need to be done regarding comparison of CRP level in both the age groups.**

## CONCLUSION

In the present study conducted over 61 RA patients and 60 CHD patients. The CRP level evaluated and its CRP level found to be higher in CHD patients than RA patients significantly. Since, CRP is common inflammatory marker in both the diseases, we can conclude that CRP level is higher in CHD patients than RA patients.

When CRP level was evaluated age group wise in both the diseases then it was found that CRP level is higher in age group B than age group A in RA and CRP level is higher in age group A than age group B in CHD. This shows that CRP level can differ according to age differences. Further studies are necessary to understand how CRP level can vary age and disease wise.

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