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ORIGINAL RESEARCH

Comparative evaluation of CRP level in healthy and periodontitis patients

Ridhi Taneja¹, Varun Arora², Nitin Sangwan³

¹BDS Junior resident, Department of Dentistry, Kalpana Chawla Medical College Karnal, Haryana, India;

²MDS Periodontics and Implantology Resident Department of Dentistry, Kalpana Chawla Medical College Karnal, Haryana, India;

³MDS Periodontics and Implantology, Practicing Periodontist Sangwan Clinic, Old Bus Stand Gohana, India

ABSTRACT:

Background: Periodontitis is an inflammatory disease of the supporting tissues of the teeth. The present study was conducted to assess CRP level in healthy and periodontitis patients. **Materials & Methods:** The present study was conducted on 50 subjects chronic gingivitis and periodontitis. Patients were divided into 3 groups. Group I were controls, group II were gingivitis patients and group III were periodontitis patients. Levels of CRP were quantified using a sandwich enzyme-linked immunosorbent assay (ELISA) according to the manufacturer's instructions. **Results:** Group I was control group, group II was chronic gingivitis group and group III was periodontitis group III. Each group had 25 subjects. The mean PD in group I was 1.24 mm, in group II was 3.11 mm and in group III was 3.44. AL was 1.96 mm in group I, 4.02 mm in group II and 4.27 mm in group III. The difference was significant ($P < 0.05$). The mean CRP level was 3018.2 pg/ml in group I, 3567.7 pg/ml in group II and 5231.9 pg/ml in group III. The difference was significant ($P < 0.05$). **Conclusion:** C - reactive protein is the most important factors in the acute phase. There was increase level of CRP in gingivitis and periodontitis group as compared to healthy subjects.

Key words: C - reactive protein, Gingivitis, Periodontitis.

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Corresponding author: Dr. Ridhi Taneja, BDS Junior resident, Department of Dentistry, Kalpana Chawla Medical College Karnal, Haryana, India

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INTRODUCTION

Periodontitis is an inflammatory disease of the supporting tissues of the teeth which is caused by specific microorganisms and characterized by extensive destruction of periodontal ligament and alveolar bone with pocket formation, gingival recession or both.¹ Gingivitis is a gum inflammatory disease and clinically the presence of identifiable attachment loss in periodontitis makes it be distinguishable from gingivitis.²

Host immune response to pathogens such as bacteria in the teeth plaque biofilm is as cooperation of innate and acquired immune system. Although periodontitis is a chronic inflammatory disease but the agents of the acute phase of inflammation which belong to the innate immunesystem are involved in the disease.³

It has been shown that hsCRP levels become raised in gingival and periodontal diseases and they reflect the degree of systemic trauma after surgery. Host immune response to pathogens such as bacteria in the teeth plaque biofilm is as cooperation of innate and acquired immune system. Although periodontitis is a chronic inflammatory disease but the agents of the acute phase of inflammation which belong to the innate immune system are involved in the disease. These agents may cause the activation of complement system, neutralization of pathogenesis agents, stimulation of repair systems and degeneration of different tissues.⁴

C - reactive protein (CRP), plasminogen-activator inhibitor 1 (PAI-1) and fibrinogens are the most important factors in the acute phase. There are several methods to measure

hsCRP. They are ELISA, immuno turbidimetry, nephelometry, rapid immune- diffusion and visual agglutination. After trauma or operation a rise of CRP- levels in serum was seen as expression of inflammatory response.⁵ The present study was conducted to assess CRP level in healthy and periodontitis patients.

MATERIALS & METHODS

The present study was conducted in the department of Periodontics. It comprised of 50 subjects chronic gingivitis and periodontitis. 25 healthy subjects were taken as control. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 3 groups. Group I were controls, group II were gingivitis patients and group III were periodontitis patients.

Plaque index, gingival index and probing depth were assessed in all. Unstimulated saliva sample was collected from each subject using spitting method. Levels of CRP were quantified using a sandwich enzyme-linked immunosorbent assay (ELISA) according to the manufacturer’s instructions. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant (P< 0.05).

RESULTS

Table I Distribution of patients

Groups I	Group I	Group II
Healthy (Control)	Chronic Gingivitis	Chronic Periodontitis
25	25	25

Table I shows that group I was control group, group II was chronic gingivitis group and group III was periodontitis group III. Each group had 25 subjects.

Table II Comparison of parameters

Parameters (Mean)	Group I	Group II	Group III	P value
Probing depth (mm)	1.24	3.11	3.44	0.01
Attachment level (mm)	1.96	4.02	4.27	0.05

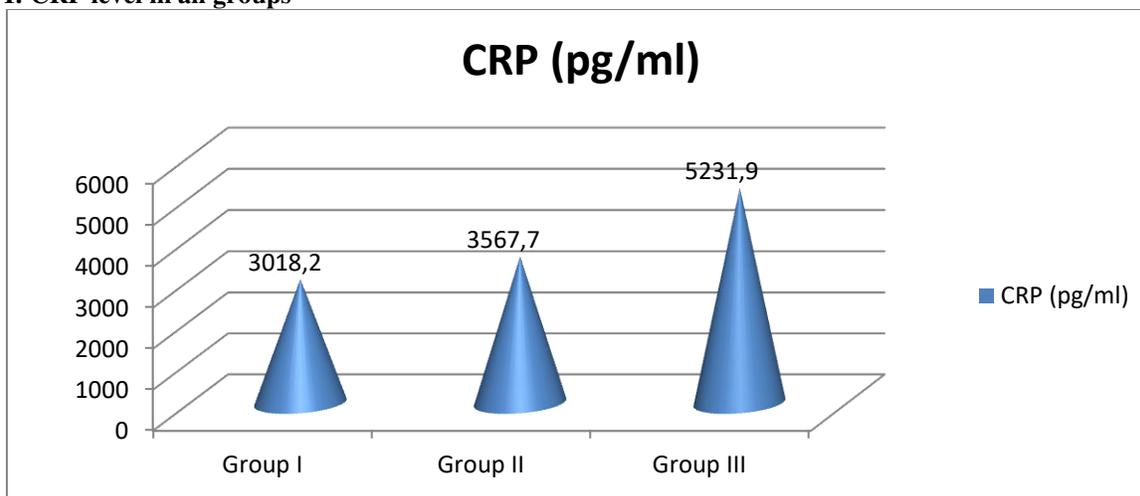
Table II shows that mean PD in group I was 1.24 mm, in group II was 3.11 mm and in group III was 3.44. AL was 1.96 mm in group I, 4.02 mm in group II and 4.27 mm in group III. The difference was significant (P< 0.05).

Table III CRP level in all groups

Parameters (Mean)	CRP (pg/ml)	P value
Group I	3018.2	0.05
Group II	3567.7	
Group III	5231.9	

Table III shows that mean CRP level was 3018.2 pg/ml in group I, 3567.7 pg/ml in group II and 5231.9 pg/ml in group III. The difference was significant (P< 0.05).

Graph I: CRP level in all groups



DISCUSSION

Highly sensitive C -reactive protein (hs CRP) is an acute phase protein produced in hepatocytes. It is one of the serum inflammatory markers which are widely used in the follow-up of patients with localized infections in the orthopedic domain, but trauma or surgery may also result in their transient elevation.⁶ hs CRP is phylogenetically highly conserved plasma protein that participates in systemic response to inflammation. Its plasma concentration increases during inflammatory states.⁷

The plasma levels of hsCRP in healthy adults are less than 10 mg/l. The rapid increase in synthesis within hours of tissue injury suggests that it contributes to host defense and is part of innate immune response.³ Thus raised hsCRP in healthy adults is considered to be useful parameter in detecting complications of bacterial infections after surgery to reflect the extent of surgical trauma.⁸

Several studies have also suggested a correlation between periodontitis and cardiovascular diseases. In some studies, it has even been claimed that there are some correlations between periodontal disease and atherosclerotic heart disease and heart attacks and strokes. Although their cause and effect relationship has not been established, but it is likely that elevation of CRP levels in periodontitis may help to understand the relationship between cardiovascular diseases and periodontitis.^{9,10} The present study was conducted to assess CRP level in healthy and periodontitis patients.

In present study, there were 50 patients. Group I was control group, group II was chronic gingivitis group and group III was periodontitis group. Each group had 25 subjects. Kanaparthi et al¹¹ conducted a study in which subjects were divided into three groups of healthy (n = 30), gingivitis (n = 30), and chronic periodontitis (n = 30), based on Gingival Index (GI) and Clinical Attachment Loss (CAL) indices. 2ml saliva samples were collected from these people and clinical indicators including GI, CAL, Periodontal Pocket Depth (PPD), and Bleeding Index (BI) were assessed. ELISA method was used to evaluate the salivary CRP levels. The mean salivary CRP levels were 5332.62±5051.63pg/ml in periodontitis patients, 3545.41±3061.38pg/ml in gingivitis group and 3108.51±3574.47pg/ml in healthy subjects. The statistic analysis showed a significant difference in salivary CRP concentrations between the periodontitis patients and healthy subjects (P=0.045). The results indicate that there is a significant association between periodontitis and salivary CRP concentrations.

We observed that mean PD in group I was 1.24 mm, in group II was 3.11 mm and in group III was 3.44. AL was 1.96 mm in group I, 4.02 mm in group II and 4.27 mm in group III. The mean CRP level was 3018.2 pg/ml in group I, 3567.7 pg/ml in group II and 5231.9 pg/ml in group III. The difference was significant (P< 0.05).

Kamil et al¹² investigated the effects of treatment of advanced periodontitis on serum CRP levels and the results

showed that the serum CRP level decreased significantly after the non-surgical treatment, and the decrease in CRP had a significant relationship with decrease in PI, BI, GI in a direct and linear way. After statistical analysis, it was observed that the periodontitis patients had the highest CRP levels followed in order by gingivitis patients and healthy subjects. These results suggest that periodontal problems can affect the salivary CRP level and enhance it. Also, in the present study, an increase in CRP levels had a direct and significant relationship with increasing values of GI BI, and CAL.

CONCLUSION

C - reactive protein is the most important factors in the acute phase. There was increase level of CRP in gingivitis and periodontitis group as compared to healthy subjects.

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