

Original Article

Assessment to levels of C reactive proteins in patients with Generalised Periodontitis

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ABSTRACT:

Background: 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. **Aim of the study:** To assess levels of C reactive proteins in patients with generalised periodontitis. **Materials and methods:** The study was conducted in the Department of Periodontology of the Dental institution. For the study, we selected patients who were referred to the department of periodontology. The inclusion criteria were lack of systemic disease, not taking antibiotics from past one month, no intraoral lesions, and not who have not undergone any periodontal procedure for 6 months. A total of 50 subjects with generalized periodontitis and 50 control healthy patients were selected. For the analysis of saliva CRP level, unstimulated saliva sample was collected using spitting method for each subject. **Results:** A total of 50 patients were enrolled in each group, Periodontitis group and Control group. The mean age of patients in periodontitis group was 33.12 years and in control group was 31.21 years. Mean CRP level in periodontitis group was 3000.87 pg/mL and in control group was 5107.87 pg/mL. **Conclusion:** From the results of present study, we conclude that there is correlation between salivary CRP levels and severity of periodontal disease and the measurement of CRP level can be used for the diagnosis of periodontitis.

Keywords: Periodontitis, gingiva, gingivitis.

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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.^{1,2} Gingivitis is a gum inflammatory disease and clinically the presence of identifiable attachment loss in periodontitis makes it be distinguishable from gingivitis.³ 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. CRP is protein synthesized in the liver and the major protein of plasma. Its half-life is approximately 6-4 hours. The serum levels of this protein increase rapidly within 24 to 72 hours in conditions of inflammation or tissue damage and will subside after the removal of inflammation or infection.^{5, 6} Hence, the present study was conducted to assess levels of C reactive proteins in patients with generalised periodontitis.

MATERIALS AND METHODS:

The study was conducted in the Department of Periodontology of the Dental institution. The ethical clearance for study protocol was obtained from ethical committee of the institution. For the study, we selected patients who were referred to the department of periodontology. The inclusion criteria were lack of systemic disease, not taking antibiotics from past one month, no intraoral lesions, and not who have not undergone any periodontal procedure for 6 months. A total of 50 subjects with generalized periodontitis and 50 control healthy patients were selected. The subjects were categorized based on gingival index, clinical attachment loss indices into 3 equal groups of healthy, plaque-induced gingivitis and chronic periodontitis. For the analysis of saliva CRP level, unstimulated saliva sample was collected using spitting method for each subject. Patients were restricted from eating or drinking for 2 hours before

collecting samples. After collection of samples, salivary CRP level was evaluated in the laboratory.

The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student’s t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistical significant.

RESULTS:

Table 1 shows the demographic details of the participants. A total of 50 patients were enrolled in each group, Periodontitis group and Control group. The mean age of patients in periodontitis group was 33.12 years and in control group was 31.21 years. Number of male subjects in periodontitis group was 18 and in control subjects was 20. Table 2 shows mean concentration of CRP in both groups. Mean CRP level in periodontitis group was 3000.87 pg/mL and in control group was 5107.87 pg/mL. The results were compared and were found to be statistical non-significant.

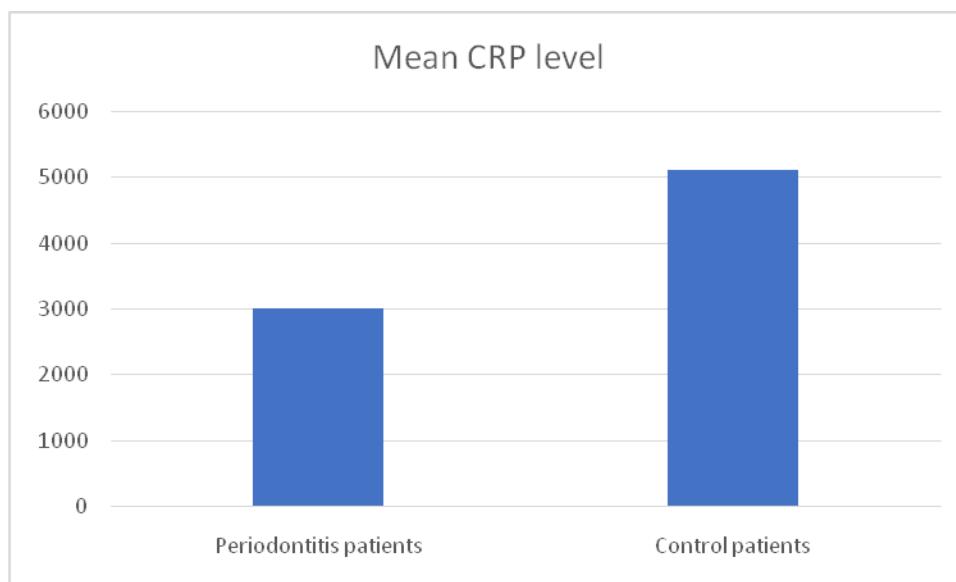
Table 1: Demographic details

Variables	Periodontitis group	Control group
Mean age (years)	33.12	31.21
Number of patients	50	50
Number of male subjects	18	20
Number of female subjects	12	10

Table 2: Mean concentration of CRP in both groups

Group	Mean CRP level (pg/mL)	p-value
Periodontitis group	3000.87	0.16
Control group	5107.87	0.21

Figure 1: Mean concentration of CRP in both groups



DISCUSSION:

In the present study, we observed that mean CRP level was increased in periodontitis group. The results were found to be statistical non-significant. The results were compared with previous studies. Shojaee M et al studied the comparison of the amount of salivary C-Reactive protein (CRP) in healthy subjects and patients with periodontal disease. This case-control study was done on 90 patients referred to the Department of Periodontology of Babol Dentistry School. These 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 ± 5051.63 pg/ml in periodontitis patients, 3545.41 ± 3061.38 pg/ml in gingivitis group and 3108.51 ± 3574.47 pg/ml in healthy subjects. The statistic analysis showed a significant difference in salivary CRP concentrations between the periodontitis patients and healthy subjects. The results indicated that there is a significant association between periodontitis and salivary CRP concentrations. Anitha G et al investigated the levels of CRP and PNM cells as a marker of inflammatory host response in the serum of chronic periodontitis patients and in patients with CVD. Study population included 75 patients; both male and female above 35 years were included for the study. The patients were divided into three groups of 25 each – Group I: Chronic periodontitis patients with CVD, Group II: Chronic periodontitis patients without CVD and Group III: Control subjects (without chronic periodontitis and CVD). Patients with chronic periodontitis had ≥ 8 teeth involved with probing depth (PD) ≥ 5 mm involved. The control group had PD ≤ 3 mm and no CVD. Venous blood was collected from the patients and C-reactive protein levels were analyzed by immunoturbidimetry. On comparison, OHI-S Index, GI, mean PD, CRP and PMN values showed significant difference from Group I to III. CRP level was highly significant in Group I when compared with Group II and Group III. PMN level was highly significant in Group I when compared with Group III PMN level which was not significant. This study indicated that periodontitis may add the inflammation burden of the individual and may result in increased levels of CVD based on serum CRP levels. Thus, controlled prospective trials with large sample size should be carried out to know the true nature of the relationship if indeed one exists.^{7, 8}

Bansal T et al compared and evaluated the systemic levels of CRP in the serum sample of the patients with healthy gingiva, gingivitis, and chronic periodontitis. A total of 60 systemically healthy patients were selected and divided into three groups: Patients with healthy gingiva (Group A), patients with generalized gingivitis (Group B) and patients

with chronic periodontitis (Group C). Peripheral blood was collected and high-sensitive (hs)-CRP levels were estimated in the serum samples by using the particle-enhanced turbidimetric immuno-assay technique using a commercially available kit. The mean hs-CRP level in Group A recorded was 0.437 ± 0.216 , Group B was 0.771 ± 0.384 and Group C was 2.285 ± 0.381 . A significantly elevated hs-CRP level was found in Group C as compared with Group B and A. However, a moderate, but statistically significant increase in the hs-CRP levels was observed in Group B as compared with Group A. The percentage of patients with elevated levels of hs-CRP > 2 mg/l was significantly higher in Group C. They concluded that the patients with chronic periodontitis demonstrated a mean hs-CRP levels higher than the patients with gingivitis and with healthy gingiva. Mattila K et al studied if treatment of periodontitis can decrease the levels of these inflammatory markers. C-reactive protein and fibrinogen levels were measured in 35 patients (21 M, 14 F, mean age 50 years) with adult periodontitis, before and after treatment. The median baseline C-reactive protein level in the patients was 1.05 mg/l and it decreased to 0.7 mg/l after periodontal treatment. Of the 30 patients who could be included in the analyses, 24 patients had a baseline level below 2 mg/l (the 95th percentile limit in Finland); 6 patients had levels higher than this. Elevation of the baseline C-reactive protein level or the magnitude of its decrease were not associated with severe form of periodontitis. The decrease in C-reactive protein levels was at least 50 % in 4/6 of those with elevated baseline levels, as compared with 3/24 of the rest of the patients. No corresponding effect was observed in fibrinogen levels. They concluded that periodontitis seems to increase C-reactive protein only in some individuals, presumably the ones reacting to it with a systemic inflammatory reaction. Periodontal treatment decreases C-reactive protein levels in these individuals and it may thus decrease their risk of coronary heart disease.^{9, 10}

CONCLUSION:

From the results of present study, we conclude that there is correlation between salivary CRP levels and severity of periodontal disease and the measurement of CRP level can be used for the diagnosis of periodontitis.

REFERENCES:

1. Laxman VK, Annaji S. Tobacco use and its effects on the periodontium and periodontal therapy. *J Contemp Dent Pract.* 2008;9:97–107.
2. Paraskevas S, Huizinga JD, Loos BG. A systematic review and meta-analyses on C-reactive protein in relation to periodontitis. *J Clin Periodontol.* 2008;35:277–90.
3. Nunes BK, Lacerda RA, Jardim JM. [Systematic review and meta-analysis of the predictive value of C-reactive protein in postoperative infections] *Rev Esc Enferm USP.* 2011;45:1488–94.

4. Giannobile WV, Beikler T, Kinney JS, et al. Saliva as a diagnostic tool for periodontal disease: current state and future directions. *Periodontol.* 2009;50:52–64.
5. Pitiphat W, Savetsilp W, Wara-Aswapati N. C-reactive protein associated with periodontitis in a Thai population. *J Clin Periodontol.* 2008;35:120–5.
6. Wohlfeil M, Scharf S, Siegelin Y, et al. Increased systemic elastase and C-reactive protein in aggressive periodontitis (CLOI-D-00160R2) *Clin Oral Investig.* 2012;16:1199–207.
7. Shojaee M, Fereydooni Golpasha M, Maliji G, Bijani A, Aghajanjpour Mir SM, Mousavi Kani SN. C - reactive protein levels in patients with periodontal disease and normal subjects. *Int J Mol Cell Med.* 2013;2(3):151-5.
8. Anitha G, Nagaraj M, Jayashree A. Comparative evaluation of levels of C-reactive protein and PMN in periodontitis patients related to cardiovascular disease. *J Indian Soc Periodontol.* 2013;17(3):330-2.
9. Bansal T, Dhruvakumar D, Pandey A. Comparative evaluation of C-reactive protein in peripheral blood of patients with healthy gingiva, gingivitis and chronic periodontitis: A clinical and particle-enhanced turbidimetric immuno-analysis. *J Indian Soc Periodontol.* 2014;18(6):739-43.
10. Mattila K, Vesanen M, Valtonen V, et al. Effect of treating periodontitis on C-reactive protein levels: a pilot study. *BMC Infect Dis.* 2002;2:30.

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