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Original Research

Assessment of C reactive proteins levels in patients with periodontitis

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***ABSTRACT*:**
Background: C-reactive protein (CRP), fibrinogen, and acute-phase proteins are sensitive markers to evaluate the inflammatory status. Periodontal therapy aims to alter or eliminate the origin of the microorganisms and also to prevent progression of the disease, thereby preserving the state of health of such individuals and avoiding recurrence of periodontitis. Periodontal pathogens affect the immune system and promote local and systemic inflammatory responses. **Aim of the study:** To assess C reactive proteins levels in patients with periodontitis. **Materials and methods:** The present study was conducted in the Department of Periodontology of the Dental institution. For the present study, we included a total of 100 patients with confirmed diagnosis of periodontitis. Another group of 100 patients with no systemic disease, those who were nonsmokers and those with acceptable oral hygiene, were also included in the study. An informed written consent was obtained from the participants. Gingival crevicular fluid was collected using a micro capillary pipette that was hand calibrated at every 1 mm till 10 mm, from selected sites in the subjects on 0 day, 14th day and 45th day. On every recall visit, i.e., 14th day and 45th day, oral hygiene instructions were reinforced and gingival crevicular fluid was collected for estimation of CRP. **Results:** In the present study, a total of 200 patients were included. 100 patients had periodontitis and 100 were healthy control subjects. The number of males in study group was 55 and in control group was 51. Number of female group was 45 and in female group was 49. We observed that the CRP level decreased significantly from baseline to 45th day in both groups. The CRP level was significantly higher in study group as compared to control group at baseline. **Conclusion**: Within the limitations of the present study, it can be concluded that CRP level was significantly higher in patients with periodontitis. The level decreased significantly with periodontal treatment.
Keywords: Periodontitis, GCF, CRP, periodontal treatment

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INTRODUCTION:

The local inflammatory response to pathogenic bacteria or bacterial products is characterized by infiltration of the periodontal tissues of inflammatory cells including polymorphonuclear neutrophils, macrophages, lymphocytes, and plasma cells.[1] The acute-phase response is a nonspecific process, initiated and coordinated by a large number of diverse inflammatory mediators that may occur in the initial host response to injuries, infections, ischemic necrosis or malignancy. C-reactive protein (CRP), fibrinogen, and acute-phase proteins are sensitive markers to evaluate the inflammatory status.[2] Once the type of periodontal disease has been diagnosed, it can be successfully treated. Periodontal therapy aims to alter or eliminate the origin of the microorganisms and also to prevent progression of the disease, thereby preserving the state of health of such individuals and avoiding recurrence of periodontitis. Periodontal pathogens affect the immune system and promote local and systemic inflammatory responses. [3, 4] Thus, periodontal therapy basically aims to control this inflammation. Persistent localized infection may influence the systemic levels of inflammatory mediators. One of the markers for this inflammatory response is C-reactive protein, which is an

acute-phase protein produced by various inflammatory stimuli such as trauma, infection and hypoxia. C-reactive protein levels guide decisions regarding diagnosis, monitoring and therapy for inflammatory processes and associated diseases. [5, 6] Hence, the present study was conducted to assess C reactive proteins levels in patients with periodontitis.

MATERIALS AND METHODS

The present study was conducted in the Department of Periodontology of the Dental institution. The ethical clearance for the study was approved from the ethical committee of the hospital. For the present study, we included a total of 100 patients with confirmed diagnosis of periodontitis. Another group of 100 patients with no systemic disease, those who were nonsmokers and those with acceptable oral hygiene, were also included in the study.

Exclusion criteria

- Patients who had undergone oral prophylaxis or taken antibiotic 6 months prior to the study
- Pregnant, nursing patients
- Patients with inability to comply with the follow-up visit

An informed written consent was obtained from the participants. Gingival crevicular fluid was collected using a micro capillary pipette that was hand calibrated at every 1 mm till 10 mm, from selected sites in the subjects on 0 day, 14th day and 45th day. On every recall visit, i.e., 14th day and 45th day, oral hygiene instructions were reinforced and gingival crevicular fluid was collected for estimation of CRP.

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 statistically significant.

RESULTS

In the present study, a total of 200 patients were included. 100 patients had periodontitis and 100 were healthy control subjects. The number of males in study group was 55 and in control group was 51. Number of female group was 45 and in female group was 49 [Table 1]. The mean age in study group was 39.29 years and in control group was 40.18 years. Table 2 and Fig 1 shows mean CRP level at baseline, 15th day and 45th day before and after treatment. We observed that the CRP level decreased significantly from baseline to 45th day in both groups. The CRP level was significantly higher in study group as compared to control group at baseline. The CRP level compared between both groups at 45th day was similar in values.

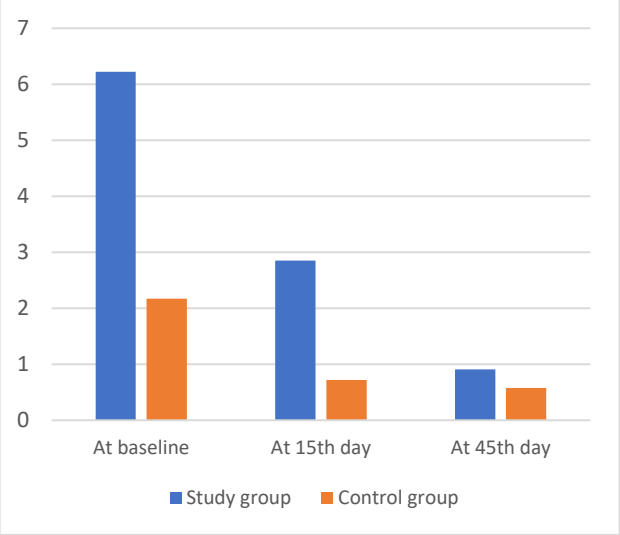
Table 1: Demographics data of the participants

Variables	Study group	Control group
Total no. of patients	100	100
No. of male patients	55	51
No. of female patients	45	49
Mean age (years)	39.29	40.18

Table 2: Mean CRP level at baseline, 15th day and 45th day before and after treatment

Mean CRP level	Study group	Control group
At baseline	6.22	2.17
At 15th day	2.85	0.72
At 45th day	0.91	0.58

Fig 1: Mean CRP level at baseline, 15th day and 45th day before and after treatment



DISCUSSION

In the present study, we observed that the mean CRP level was decreased significantly from baseline to 45th day with periodontal treatment in patients with periodontitis. Furthermore, the mean CRP level at 45th day in study group and control group was similar. The results on comparison were found to be statistically significant. The results were compared with previous studies from the literature and were found to be consistent with the results. Goyal et al [7] compared the relative levels of serum CRP in aggressive and chronic periodontitis patients. A total of 75 systemically healthy subjects were divided into three groups: Group I, nonperiodontitis subjects; group II, chronic generalized periodontitis patients and group III, generalized aggressive periodontitis patients. Mean CRP levels were significantly greater in both group II and III as compared to group I and group III having greater level than group II. Furthermore, CRP levels positively correlated with the amount of periodontal destruction as measured by

probing depth and clinical attachment loss. They concluded that a positive correlation between CRP and periodontal disease severity with particular concern in younger individuals that could be a possible underlying pathway in the association between periodontal disease and the observed higher risk for cardiovascular disease in periodontitis patients. Anitha G et al [8] 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). 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.

Bolla V et al [9] compared serum C-reactive protein (CRP) levels in subjects with chronic and aggressive periodontitis. Based on the periodontal status, 45 subjects were selected and divided into three groups. Group I – subjects with clinically healthy periodontium, Group II – generalized aggressive periodontitis (GAP), and Group III – chronic periodontitis (CP). Blood samples were collected from subjects for measurement of CRP. Periodontal parameters include plaque index (PI), gingival index, bleeding index (BI), probing pocket depth (PPD), and clinical attachment loss (CAL) were assessed. CRP levels were assessed by means of a commercially available high sensitivity-CRP enzyme immunoassay kit. CRP levels were increased in Group III and Group II subjects compared to the Group I. CRP levels showed a positive correlation with all clinical parameters in Group I subjects. BI, PI showed a positive correlation with CRP level in Group II and a positive correlation was also seen for PI, PPD, CAL, and CRP level in Group III subjects. They concluded that the mean CRP levels were found to be greater in CP compared to GAP subjects, but there was no statistically significant difference. Shojaee M et al [10] compared 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. 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. The results indicate that there is a significant association between periodontitis and salivary CRP concentrations.

Podzimek S et al [11] compared the systemic levels of CRP in the peripheral blood samples of patients with chronic and aggressive periodontitis, gingivitis, and gingival recessions. All patients (N = 158) were examined prior to the initiation of periodontal treatment. Patients were divided into four groups. Group A consisted of 26 patients with aggressive periodontitis, Group B consisted of 111 patients with chronic periodontitis, Group C consisted of 13 patients with gingivitis, and Group D consisted of 8 patients with gingival recessions. Their study results indicate that CRP levels increase subsequently with the severity of the periodontal disease and that the bleeding on probing index showed much better positive correlation with the CRP levels compared to the pocket depth index in both periodontitis patients groups, especially in aggressive periodontitis patients.

CONCLUSION

Within the limitations of the present study, it can be concluded that CRP level was significantly higher in patients with periodontitis. The level decreased significantly with periodontal treatment.

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