

## ORIGINAL RESEARCH

### C Reactive proteins levels in chronic periodontitis patients: A case control study

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#### ABSTRACT:

**Background:** Patients with periodontal disease have higher concentrations of circulating inflammatory markers, including C-reactive protein (CRP) and cytokines. Hence; the present study was conducted for assessing C Reactive proteins levels in chronic periodontitis patients. **Materials & methods:** A total of 15 patients with clinical and radiographic confirmed diagnosis of chronic periodontitis and 15 healthy controls were enrolled. Demographic characteristics, such as age, gender, diet, and medical history, body mass index were recorded. A set of full-mouth periapical radiographs was taken. Fasting (minimum of 12hrs) venous blood samples were collected. The venous blood was collected in plain vials which were sent to the laboratory for biochemical analysis and evaluation of systemic parameters of both case group and control group. Serum Highly sensitive C- reactive protein levels were assessed by means of latex enhanced auto-analysing method. **Results:** Mean C reactive proteins levels of the patients of the chronic periodontitis group and the control group was found to be 0.715 mg/dL and 0.278 mg/dL respectively. Significant results were obtained while comparing the mean C Reactive proteins levels among the patients of the chronic periodontitis group and the control group. **Conclusion:** Increase in periodontal inflammation is accompanied by a substantial increase in the concentration of C Reactive proteins levels.

**Key words:** C Reactive proteins, Periodontitis

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#### INTRODUCTION

Periodontal disease is an inflammatory process that affects the protective and supportive tissues around the tooth. Periodontal disease contributes significantly to the global burden of oral diseases and shares common risk factors with several chronic diseases. Patients with periodontal disease have higher concentrations of circulating inflammatory markers, including C-reactive protein (CRP) and cytokines. CRP has received a great deal of attention because it is now considered a risk factor for cardiovascular events when its levels are  $>2.1$  mg/l.<sup>1-3</sup>

In chronic infectious states, several immunologic and enzymatic factors recognized as mediators and/or biomarkers, of both bacterial and host origin, have been and are being studied to elaborate on the disease activity in addition to striving to establish their diagnostic and prognostic importance. Monitoring the response to treatment can be another application of such biomarkers. It is also desirable to determine

whether non-surgical periodontal therapy can decrease the levels of these markers, so that a novel link between periodontal disease and other systemic inflammatory diseases can be explored. Hence the purpose of our dissertation is to study the effect of non-surgical periodontal treatment on circulating serum high sensitivity capsule reactive protein, IL-6 and homocysteine levels in otherwise healthy subjects.<sup>4-7</sup> Hence; the present study was conducted for assessing C Reactive proteins levels in chronic periodontitis patients.

#### MATERIALS & METHODS

A total of 15 patients with clinical and radiographic confirmed diagnosis of chronic periodontitis and 15 healthy controls were enrolled. Patients who received sub-gingival periodontal debridement, periodontal surgery, or antimicrobial treatment in the previous 6 months were excluded. Patients were evaluated using a detailed questionnaire. Demographic characteristics,

such as age, gender, diet, and medical history, body mass index were recorded. A set of full-mouth periapical radiographs was taken. Fasting (minimum of 12hrs) venous blood samples were collected. The venous blood was collected in plain vials which were sent to the laboratory for biochemical analysis and evaluation of systemic parameters of both case group and control group. Serum Highly sensitive C- reactive protein levels were assessed by means of latex enhanced auto-analysing method. All the results were analyzed by SPSS software. Chi- square test and Mann-Whitney U test were used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

## RESULTS

Mean age of the patients of the control group and the chronic periodontitis group was 33.5 years and 35.7 years respectively. There were 8 males and 7 females in the control group and 9 males and 6 females in the chronic periodontitis group.

Mean C reactive proteins levels of the patients of the chronic periodontitis group and the control group was found to be 0.715 mg/dL and 0.278 mg/dL respectively. Significant results were obtained while comparing the mean C Reactive proteins levels among the patients of the chronic periodontitis group and the control group.

**Table 1:** Mean age of the subjects of the both the study groups

Parameter	Control group	Chronic periodontitis group
Mean Age (years)	33.5	35.7
+SD	3.9	3.7

**Table 2:** Capsule Reactive Protein (mg/dL) levels among subjects of both the study groups

Parameter	Healthy controls	Chronic periodontitis
Mean	0.278	0.715
SD	0.051	0.108
p- value	0.000 (Significant)	

## DISCUSSION

Knowledge of how immune mechanisms and inflammatory responses are regulated is critical for understanding the pathogenesis of complex diseases, such as periodontitis. The pathogenesis of periodontal diseases is mediated by the inflammatory response to bacteria in the dental biofilm. There is evidence that specific microbes are associated with the progressive forms of the disease; however, the presence of these microorganisms in individuals with no evidence of disease progression suggests that the disease is the net effect of the immune response and the inflammatory processes, not the mere presence of the bacteria. Regulation of immune-inflammatory mechanisms governs patient susceptibility and is modified by environmental factors.<sup>8-11</sup> Hence; the present study

was conducted for assessing C Reactive proteins levels in chronic periodontitis patients.

In the present study, mean age of the patients of the control group and the chronic periodontitis group was 33.5 years and 35.7 years respectively. There were 8 males and 7 females in the control group and 9 males and 6 females in the chronic periodontitis group. Loos et al in their study examined the levels of IL- 6 and CRP in the peripheral blood of periodontitis patients. They found that CRP, IL- 6, and neutrophil levels were elevated in periodontitis patients. Authors found that IL- 6 to increase in a dose- dependent manner. In general, patients with chronic severe generalized periodontitis had much higher levels and were much more often positive for IL- 6 than the controls, because IL- 6 could not be measured in many controls.<sup>12</sup>

In the present study, mean C reactive proteins levels of the patients of the chronic periodontitis group and the control group was found to be 0.715 mg/dL and 0.278 mg/dL respectively. Significant results were obtained while comparing the mean C Reactive proteins levels among the patients of the chronic periodontitis group and the control group. Yamazaki et al<sup>13</sup> reported from a study on Japanese that there was no statistically significant difference in IL-6 and hsCRP before and after therapy. They reported that this lack of statistical significance may reflect the various contributions made by periodontal disease to the total burden of inflammation in different patients and the relatively small numbers of patients. Ioannidou et al<sup>13</sup> after assessing the results of their meta-analysis, didn't support the hypothesis that periodontal treatment can reduce systemic CRP levels. The data presented by them were for patients following a single course of periodontal treatment, and hence some residual diseased sites remained, and there may have been insufficient time for biochemical changes to be established after disease reduction.<sup>14</sup> Salzberg et al determined the relative levels of serum CRP in AgP patients and periodontally healthy subjects and examined patients' characteristics that might account for intergroup differences. Serum samples were collected from 93 patients with generalized AgP (GAgP), from 97 patients with localized AgP (LAgP), and from 91 healthy controls (non-periodontitis [NP]). Periodontal examination consisted of plaque index, gingival index, probing depth, bleeding index, and attachment loss measurements. Current smoking was assessed by determination of serum cotinine levels by enzyme-linked immunosorbent assay (ELISA), and serum CRP levels were determined using a high-sensitivity ELISA assay. CRP levels in both LAgP and GAgP subjects were significantly greater than those in NP subjects, and levels in GAgP were significantly greater than those in LAgP. Both mean probing depth and periodontal diagnosis remained correlated with CRP levels.<sup>15</sup>

## CONCLUSION

From the above results, the authors conclude that Increase in periodontal inflammation is accompanied by a substantial increase in the concentration of C Reactive proteins levels.

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