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Original Research

CRP Levels in Patients with Periodontitis

Gurmanjot Kaur

Lecturer, Department of Orthodontics, Dasmesh Institute of Research and Dental Sciences, Faridkot, Punjab, India

ABSTRACT:

Background: This study was carried out to evaluate CRP levels among subjects with periodontitis. **Material and methods:** This research aimed to evaluate CRP levels in individuals diagnosed with periodontitis. The study included 100 participants, consisting of 50 control subjects and 50 individuals with periodontitis. The procedure of the study was thoroughly explained to all participants, who were then requested to provide their consent. All participants granted their consent, thus allowing for their inclusion in the study. CRP levels were assessed in both the control group and the group with periodontitis. The results were compared and organized into tables. Statistical analysis was performed utilizing SPSS software. **Results:** In this research, group 1 consisted of 50 control subjects, while group 2 included 50 subjects diagnosed with periodontitis. The average CRP levels for the control group were recorded at 1.9±3.7 mg/dl. Conversely, the average CRP levels for the periodontitis group were found to be 4.5±3.5 mg/dl. **Conclusion:** Based on the results of this research, it can be inferred that the average CRP levels in subjects diagnosed with periodontitis were elevated compared to the CRP levels observed in the control group.

Keywords: CRP Levels, Periodontitis

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Corresponding Author: Gurmanjot Kaur, Lecturer, Department of Orthodontics, Dasmesh Institute of Research and Dental Sciences, Faridkot, Punjab, India

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INTRODUCTION

Periodontitis is an inflammatory condition that impacts the supporting structures of the teeth, resulting from specific microorganisms. It is characterized by considerable destruction of the periodontal ligament and alveolar bone, which can lead to the development of pockets, gingival recession, or both.

Conversely, gingivitis is an inflammatory disease affecting the gums. The clinical identification of attachment loss in periodontitis enables its differentiation from gingivitis.[1]

The immune response of the host to pathogens, such as bacteria present in dental plaque biofilm, involves a synergy between the innate and acquired immune systems. Although periodontitis is categorized as a chronic inflammatory disease, the agents responsible for the acute phase of inflammation, which are components of the innate immune system, contribute to the disease process.

These agents may activate the complement system, neutralize pathogenic entities, stimulate repair mechanisms, and result in the degeneration of various tissues. Critical factors in the acute phase include C-reactive protein (CRP), plasminogen-activator inhibitor 1 (PAI-1), and fibrinogens. CRP is a protein synthesized in the liver and is the primary protein found in plasma. Its half-life is approximately 6 to 8 hours. Serum levels of this protein increase rapidly within 24 to 72 hours during inflammatory conditions or tissue damage and decline following the resolution of inflammation or infection.[2,3]

This study was conducted to assess CRP levels in patients with periodontitis.

MATERIAL AND METHODS

This research aimed to evaluate CRP levels in individuals diagnosed with periodontitis. The study included 100 participants, consisting of 50 control subjects and 50 individuals with periodontitis. The procedure of the study was thoroughly explained to all

participants, who were then requested to provide their consent. All participants granted their consent, thereby allowing their inclusion in the study. CRP levels were assessed in both the control group and the group with periodontitis. The results were compared and organized into tables. Statistical analysis was performed utilizing SPSS software.

RESULTS

Table 1: Group-wise distribution of subjects

Groups	Number of subjects	Percentage
Group 1(Control)	50	50
Group 2(Periodontitis)	50	50
Total	100	100

In this research, group 1 consisted of 50 control subjects, while group 2 included 50 subjects diagnosed with periodontitis.

Table 2: CRP Levels in the subjects of both groups

Groups	CRP Levels (mg/dl)
Group 1	**1.9±3.7**
Group 2	**4.5±3.5**

The average CRP levels for the control group were recorded at 1.9±3.7 mg/dl. Conversely, the average CRP levels for the periodontitis group were found to be 4.5±3.5 mg/dl.

DISCUSSION

C-reactive protein (CRP) is a pentameric molecule that possesses a range of properties, such as antibacterial activity, the enhancement of proinflammatory cytokine production, a decrease in the advancement of autoimmune diseases, the promotion of tissue repair and regeneration, and the facilitation of foam cell formation in atheromas.[4] In healthy individuals, CRP levels are generally found in minimal amounts, specifically below 0.3 mg/l. Those with serum CRP concentrations exceeding 3 mg/l are considered to be at a heightened risk for future cardiovascular diseases and events.[5]

Even after accounting for known risk factors that lead to increased CRP levels, elevated CRP levels were still observed in individuals with severe periodontal disease. Chronic periodontitis (CP) develops gradually, while aggressive periodontitis progresses swiftly. Assessing CRP levels in individuals with periodontitis may offer valuable insights into the mechanisms that connect periodontal disease, cardiovascular disease (CVD), and impaired blood glucose levels.[6,7]

This study was conducted to assess CRP levels in patients with periodontitis.

In this research, group 1 consisted of 50 control subjects, while group 2 included 50 subjects diagnosed with periodontitis. The average CRP levels for the control group were recorded at 1.9±3.7 mg/dl. Conversely, the average CRP levels for the periodontitis group were found to be 4.5±3.5 mg/dl.

Shojaee M et al.[8] carried out a study to compare the levels of salivary C-Reactive protein (CRP) in healthy individuals and those suffering from periodontal disease. This case-control research involved 90 patients who were referred to the Department of Periodontology at Babol Dentistry School. The participants were categorized into three groups: healthy (n = 30), gingivitis (n = 30), and chronic periodontitis (n = 30), based on the Gingival Index (GI) and Clinical Attachment Loss (CAL) indices. Saliva samples of 2ml were collected from these individuals, and clinical parameters such as GI, CAL, Periodontal Pocket Depth (PPD), and Bleeding Index (BI) were evaluated. The ELISA method was employed to measure the salivary CRP levels. The gathered data were analyzed using SPSS statistical software, applying non-parametric tests including the Kruskal-Wallis and Mann-Whitney tests, with a significance level set at $P<0.05$. The average salivary CRP levels were found to be 5332.62±5051.63pg/ml in patients with periodontitis, 3545.41±3061.38pg/ml in the gingivitis group, and 3108.51±3574.47pg/ml in healthy subjects. Statistical analysis revealed a significant difference in salivary CRP concentrations between periodontitis patients and healthy individuals ($P=0.045$). These findings suggest a significant correlation between periodontitis and salivary CRP levels.

Bolla V et al.[9] carried out a study aimed at evaluating and comparing serum C-reactive protein (CRP) levels among individuals with chronic and aggressive periodontitis. A total of 45 subjects were selected based on their periodontal status and categorized into three distinct groups. Group I consisted of individuals with a clinically healthy periodontium, Group II included those with generalized aggressive periodontitis (GAP), and Group III comprised subjects with chronic periodontitis (CP). Blood samples were obtained from the participants to measure CRP levels. The periodontal parameters assessed included plaque index (PI), gingival index, bleeding index (BI), probing pocket depth (PPD), and clinical attachment loss (CAL). The measurement of CRP levels was conducted using a commercially available high sensitivity-CRP enzyme immunoassay kit. The results indicated that CRP levels were elevated in Group III (6.0671 ± 3.15639 mg/L) and Group II (4.5453 ± 2.88116 mg/L) when compared to Group I (1.0180 ± 0.94069 mg/L). Furthermore, a positive correlation between CRP levels and all clinical parameters was observed in Group I subjects. In Group II, BI ($r = 0.073$) and PI ($r = 0.120$) exhibited a positive correlation with CRP levels, while in Group III, positive correlations were noted for PI ($r = 0.492$), PPD ($r = 0.340$), CAL ($r = 0.160$), and CRP levels. Although the mean CRP levels were higher in CP subjects compared to those with GAP, the difference was not statistically significant.

CONCLUSION

Based on the results of this research, it can be inferred that the average CRP levels in subjects diagnosed with periodontitis were elevated compared to the CRP levels observed in the control group.

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