

ORIGINAL RESEARCH

Assessment Of C Reactive Protein Levels In Implant Failure Patients

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ABSTRACT

Introduction- Dental implants are one of the common treatments involved for prosthetic rehabilitation of missing teeth. Hence; the present study was conducted for assessing CRP levels in implant failure patients.

Materials and methods- 26 individuals diagnosed with implant failure based on clinical and radiographic criteria were recruited for the study. Another group of 26 participants attending routine health check-ups served as the healthy control group. Detailed clinical and demographic information was collected from all participants, and full-mouth periapical radiographs were taken as per established protocols. Data analysis was performed using SPSS software.

Results- 26 patients with implant failure and 26 healthy controls were done. In the study approximately 64% of the patients in the implant failure group and approximately 52% of the individuals in the control group were aged over 40 years. Furthermore, 61.5% of the implant failure patients and 46.1% of the control group participants were male.

Conclusion- periodontal inflammation in patients with implant failure is often associated with a significant rise in CRP levels.

Keywords: protein, inflammation, gum

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INTRODUCTION

Periodontitis is a long-lasting inflammatory condition triggered by an imbalanced dental biofilm¹ and characterized by the gradual breakdown of gum tissues.² The presence of bacteria and their byproducts not only disrupts the health of the gum tissues but also instigates both local and systemic inflammatory responses.^{3,4} Patients with periodontitis often display elevated levels of pro-inflammatory substances and may experience changes in their blood profile, including increased C-reactive protein (CRP) levels.⁵ CRP is a protein produced by the liver in response to infection or injury, serving as a marker of acute inflammation^{6,7}. While traditional CRP tests have a wider measurement range, high sensitivity CRP (hs-CRP) tests offer greater accuracy within a narrower range. The correlation between CRP levels and periodontitis has attracted significant interest, particularly due to the known connection between periodontitis and cardiovascular disease. Additionally, CRP has emerged as a valuable indicator of the relationship between periodontitis and various other systemic conditions.⁸ A greater concentration of these mediators of inflammation such as C-reactive protein (CRP), fibrinogen, and cytokines are observed in

patients suffering from periodontal diseases. Hence, we aimed to analyze the CRP levels in patients with implant failure.

MATERIALS AND METHODS

26 individuals diagnosed with implant failure based on clinical and radiographic criteria were recruited for the study. Another group of 26 participants attending routine health check-ups served as the healthy control group. Detailed clinical and demographic information was collected from all participants, and full-mouth periapical radiographs were taken as per established protocols.⁹ All participants were scheduled for morning appointments after a minimum 12-hour fasting period, during which venous blood samples were collected using plain vials. These samples were then sent to the laboratory for biochemical analysis, specifically evaluating serum CRP levels using latex-enhanced nephelometric method. Data analysis was performed using SPSS software.

RESULTS

26 patients with implant failure and 26 healthy controls were done. In the study approximately 64% of the patients in the implant failure group and

approximately 52% of the individuals in the control group were aged over 40 years, as indicated in Table 1. Furthermore, 61.5% of the implant failure patients and 46.1% of the control group participants were male.

Table: 1 Demographic Data

Parameter	Implant failure group, number of patients (%)	Control group, number of patients (%)
Age group (years)		
<25	3(11.5%)	5(19.2%)
25-40	6(23%)	7(26.9%)
40-50	9(34.6%)	7(26.9%)
>50	8(30.7%)	7(26.9%)
Gender		
Males	16(61.5%)	12(46.1%)
Female	10(38.5%)	14(53.9%)

The average CRP levels among patients in the implant failure group and the control group were determined to be 0.571mg/dL and 0.362 mg/dL, respectively, according to Table 2. Statistical analysis revealed a notable difference in mean CRP levels, with the implant failure group exhibiting significantly higher levels compared to the healthy controls.

Table: 2 Comparison of C-reactive protein levels (mg/dL)

CRPs (mg/dL)	Implant failure group	Control group	p
Mean	0.571	0.362	0.001
SD	0.065	0.121	significant

CRPs: C-reactive proteins, SD: Standard deviation

DISCUSSION

Periodontitis is defined as the inflammatory disease of the supporting tissues of the teeth caused by specific microorganisms or groups of specific microorganisms, resulting in progressive destruction of the periodontal ligament and alveolar bone with pocket formation, recession or both¹⁰. Increased levels of acute-phase proteins have been noted with gingival inflammation and periodontitis, reflecting the locally stressed environment.¹¹ Since CRP is an acute-phase reactant produced by the liver in response to diverse inflammatory stimuli, recent studies have shown that their levels are elevated in periodontal disease. However, not all studies have reported an association between destructive periodontal disease and CRP.

In this study 26 patients with peri implantitis and 26 healthy controls were done. In the study approximately 64% of the patients in the peri-implantitis group and approximately 52% of the individuals in the control group were aged over 40 years. Furthermore, 61.5% of the peri-implantitis patients and 46.1% of the control group participants were male. The average CRP levels among patients in the peri-implantitis group and the control group were determined to be 0.571mg/dL and 0.362 mg/dL, respectively. Hultin et al.¹² first reported a not statistically significant trend of higher serum CRP levels in patients with peri-implantitis. More recently, reports confirmed that higher serum CRP levels are associated with peri-implantitis^{13,14}. Vohra et al.¹⁵ conducted a study comparing inflammatory mediator levels in obese individuals and correlating them with CRP in the context of peri-implant parameters. The

study included 84 patients, and it was noted that individuals with severe obesity showed significantly heightened levels of inflammatory markers, as indicated by diagnostic results. This observed association highlights a positive correlation between the rising popularity of implant treatments and the prevalence of peri-implant disease.

As the focus of modern healthcare shifts towards prevention rather than solely treatment, there is a growing emphasis on identifying predisposing factors for conditions like atherosclerosis and implementing early interventions. Among these factors, periodontal diseases are gaining attention. Despite the availability of successful treatment approaches and well-understood preventive measures, periodontitis remains prevalent in many countries.

It is essential for dental professionals to educate patients on preventing periodontal diseases and ensure that individuals in need of treatment receive appropriate care, including referrals to specialists when necessary. This proactive approach can help address the impact of periodontal diseases on overall health and contribute to improved preventive strategies in healthcare.

CONCLUSION

The presence of heightened periodontal inflammation in patients with implant failure is often associated with a significant rise in CRP levels.

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