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Original Research

Evaluation of C- reactive proteins in patients with Peri- Implantitis

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ABSTRACT:

Background: To evaluate C- reactive proteins in patients with Peri- Implantitis. **Materials & methods:** A total of 40 subjects were enrolled. 20 of them were the cases of peri implantitis and 20 healthy controls were enrolled. They were classified as peri- implantitis cases and healthy control groups. Data was collected. Patients were recalled in the morning and samples of venous blood were collected. Serum CRP levels were evaluated. SPSS software was used for analysis. **Results:** Mean CRPs levels among the patients of the peri implantitis group and the control group was found to be 0.846 mg/dL and 0.312 mg/dL respectively. While analyzing statistically, it was seen that mean CRP levels among the patients of the peri-implantitis group was significantly higher in comparison to the healthy controls. **Conclusion:** Increased periodontal inflammation in peri- implantitis, periodontal disease, C- reactive protein.

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INTRODUCTION

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 both.¹ This condition occurs in response to a predominantly gram-negative bacterial infection originating from dental plaque. However, the disease typically remains asymptomatic for decades and can be detected only by clinical examination with a periodontal probe or with intraoral radiographs. It is only recently that researchers have begun to identify local and systemic inflammatory process that encourages a pathological response to an initial commensal microflora.² Increased levels of acute-phase proteins have been noted with gingival inflammation and periodontitis, reflecting the locally stressed environment.³

Peri-implant diseases affect the tissues around the implants and have an inflammatory origin. They present in the following two forms: peri-implant mucositis and peri-implantitis. In peri-implant mucositis, the inflammation is restricted to the periimplant tissue without a marginal bone loss. Periimplant mucositis is reversible through early treatment by eliminating the etiology. Peri-implantitis is an inflammation of the peri-implant mucosa accompanied by marginal bone loss. Peri-implant mucositis and peri-implantitis have a high-prevalence. ^{4,5}

CRP is a pentameric plasma protein with homologs in vertebrates and many invertebrates that participate in the systemic response to inflammation. It is a pattern recognition molecule, that is extremely sensitive and non-specific acute-phase marker for inflammation, produced in response to many forms of injury other than binding to specific molecular configurations that are typically exposed during cell death or found on the surfaces of pathogens. ⁶ CRP levels have an association with smoking, obesity, triglycerides, diabetes and periodontal disease. ⁷ CRP and other acute phase molecules are usually present at relatively low levels in plasma, but may be raised dramatically within 72hrs of tissue injury or with infection. CRP opsonizes bacteria for complement-binding and activates complement when complexed. 8 The normal CRP levels vary between populations, with mean values between 1.0 to 3.0 mg/l. However, using ultrasensitive methods, it is possible to detect CRP levels as low as <1.0 mg/l. Hence, this study was conducted to evaluate the C- reactive proteins in patients with Peri- Implantitis.

MATERIALS & METHODS

A total of 40 subjects were enrolled. 20 of them were the cases of peri implantitis and 20 healthy controls were enrolled. They were classified as periimplantitis cases and healthy control groups. Data was collected. Patients were recalled in the morning and samples of venous blood were collected. Serum CRP levels were evaluated. SPSS software was used for analysis.

RESULTS

65% of the patients of the peri implantitis group and 30% of the patients of the control group belonged to

the age group of more than 40 years. Mean age of the patients of the peri-implantitis group and the control group was found to be 40.5 years and 35.6 years, respectively. 75% of the patients of the peri-implantitis group and 60% of the subjects of the control group were males.

Mean CRPs levels among the patients of the peri implantitis group and the control group was found to be 0.846 mg/dL and 0.312 mg/dL respectively. While analyzing statistically, it was seen that mean CRP levels among the patients of the peri-implantitis group was significantly higher in comparison to the healthy controls.

Table 1: Demographic data	ographic data
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Variables	Peri- implantitis group n/ %	Control group n/ %
Age group (years)		
<30	2 (10)	2 (10)
30-40	5 (25)	12 (60)
> 40	13 (65)	6 (30)
	Gender	
Male	15 (75)	12 (60)
Female	5 (25)	8 (40)

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

CRP (mg/dL)	Peri- implantitis group	Control group	P- value
Mean	0.846	0.312	0.001*
SD	0.208	0.004	
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SD: standard deviation

*: Significant

DISCUSSION

Peri-implantitis is basically an inflammatory condition associated with a compounded bacterial attack. 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. ⁹ Hence, this study was conducted to evaluate the C- reactive proteins in patients with Peri- Implantitis.

In the present study, 65% of the patients of the peri implantitis group and 30% of the patients of the control group belonged to the age group of more than 40 years. Mean age of the patients of the periimplantitis group and the control group was found to be 40.5 years and 35.6 years, respectively. 75% of the patients of the peri-implantitis group and 60% of the subjects of the control group were males.

A study by Khichy A et al, total of 20 patients with confirmed clinical and radiographic diagnosis of periimplantitis were included in the present study. Another set of 20 subjects who reported for routine health check-up were included as healthy controls. All the subjects were recalled in the morning and fasting (minimum of 12 h) venous blood samples were obtained. Mean levels of CRPs in patients of the periimplantitis group and the control group was found to be 0.795 mg/dL and 0.294 mg/dL respectively. Mean IL-6 levels among the patients of the peri-implantitis group and the control group was found to be 12.178 pg/ml and 6.458 pg/ml respectively. While analyzing statistically, significant results were obtained. ¹⁰

In present study, mean CRPs levels among the patients of the peri implantitis group and the control group was found to be 0.846 mg/dL and 0.312 mg/dL respectively. While analyzing statistically, it was seen that mean CRP levels among the patients of the periimplantitis group was significantly higher in comparison to the healthy controls. Another study by Vohra F et al, cross-sectional retrospective study was to compare clinical and radiographic peri-implant inflammatory parameters in patients with different levels of obesity and correlate these parameters with CRP levels. Clinical (plaque index [PI], bleeding on probing [BOP], probing depth [PD]) and radiographic (marginal bone loss [MBL]) peri-implant parameters were recorded. Peri-implant PI, BOP, PD, and MBL were significantly higher in group-1, -2, and -3 patients as compared to nonobese individuals (P <.05). Peri-implant PI, BOP, PD, and MBL were significantly higher in obese patients of group-2 and group-3 as compared to obese patients in group-1 (P <.01). Mean PI, BOP, PD, and MBL were comparable between group-2 and group-3 patients (P > .05). A significant positive correlations were found between CRP levels and BOP (P = .0148) and PD (P = .0425); and significant negative correlation was found for MBL in group 3, respectively (P = .0212). ¹¹

Megson et al., suggested that CRP in GCF appears to be of systemic origin. Our study reported an increase in GCF-CRP after SRP in chronic periodontitis patients. However, the clinician must understand that once the GCF were collected, and the estimation of CRP levels in GCF are too low to be compared with serum CRP levels. It has also been documented by Megson et al, that the correlation between GCF and serum levels of CRP still requires further investigation before GCF can be considered suitable for the noninvasive assessment of the degree of systemic inflammation in both periodontitis and nonperiodontitis patients. 12

CONCLUSION

Increased periodontal inflammation in periimplantitis cases is due to increase in CRP levels.

REFERENCES

- Newman MG, Takei HH, Klollevold PR, Carranza FA. Classification of diseases and conditions affecting the periodontium. Clinical Periodontology. Edition 10th. Philadelphia: Saunders; 2006. pp. 103–04.
- Slade GD, Offenbacher S, Beck JD, Heiss G, Pankow JS. Acute-phase inflammatory response to periodontal disease in the US population. J Dent Res. 2000;79(1):49–57
- 3. Black S, Kushner I, Samols D. C-reactive Protein. J Biol Chem. 2004;279:48487–90.
- 4. Lee C T, Huang Y W, Zhu L, Weltman R. Prevalences of peri-implantitis and peri-implant mucositis: systematic review and meta-analysis. J Dent. 2017;62:1–12.

- Berglundh T, Armitage G, Araujo M G et al. Periimplant diseases and conditions: consensus report of workgroup 4 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. J Clin Periodontol. 2018;45 20:S286– S291.
- Black S, Kushner I, Samols D. C-reactive Protein. J Biol Chem. 2004;279:48487–90.
- Gomes-Filho IS, Coelho JMF, Cruz SS, Passos JS, Freitas COT, Farias NSA, et al. Chronic periodontitis and C-reactive protein levels. J Periodontol. 2011;82:969–78.
- 8. Gani DK, Lakshmi D, Krishnan R, Emmadi P. Evaluation of C-reactive protein and interleukin-6 in the peripheral blood of patients with chronic periodontitis. J Ind Soc Periodontol. 2009;13(2):69–74
- Craig RG, Yip JK, So MK, Boylan RJ, Socransky SS, Haffajee AD. Relationship of destructive periodontal disease to the acute-phase response. J Periodontol. 2003;74:1007–16.
- Khichy A, Khichy R, Singh R, Bali Y, Kaur S, Gill TK. Assessment of Levels of C-Reactive Proteins and Interleukin 6 in Patients with Peri-Implantitis: A Case-Control Study. J Pharm Bioallied Sci. 2021 Jun;13(Suppl 1):S444-S447. doi: 10.4103/jpbs.JPBS_540_20. Epub 2021 Jun 5. PMID: 34447130; PMCID: PMC8375811.
- Vohra F, Alkhudhairy F, Al-Kheraif AA, Akram Z, Javed F. Peri-implant parameters and C-reactive protein levels among patients with different obesity levels. Clin Implant Dent Relat Res. 2018 Apr;20(2):130-136. doi: 10.1111/cid.12556. Epub 2017 Nov 16. PMID: 29148260.
- Megson E, Fitzsimmons T, Dharmapatni K, Bartold PM. C-reactive protein in gingival crevicular fluid may be indicative of systemic inflammation. J Clin Periodontol. 2010;37:797–804