

Original Research

Assessment of C Reactive proteins levels in patients with peri-implantitis

Prabhdeep Kour¹, Pratima Oswal², Neha Nainee³, Yashashree Pawashe⁴

¹Dental Surgeon (Periodontist), Guru Nanak Mission Hospital, Jammu;

²Senior Lecturer, Department of Periodontology, Tatyasaheb Kore dental college and research centre, Kolhapur;

³MDS Periodontology, Private Practitioner, Delhi;

⁴MDS, Oral medicine and radiologist, Private Practitioner, Pune;

ABSTRACT:

Background: Peri-implant disease is a chronic inflammatory condition caused by bacterial plaque contamination. C reactive protein (CRP) is considered an acute-phase reactant and was shown to induce the expression of cellular adhesion molecules, thus mediating the adhesion of leukocytes to the vascular endothelium. Hence; the present study was conducted by assessing C Reactive proteins levels in patients with peri-implantitis. **Materials & methods:** A total of 120 patients were enrolled and were broadly divided into two study groups with 60 patients in each group as follows: **Group A:** Peri-implantitis patients, and **Group B:** Healthy controls. Complete demographic details of all the patients were obtained. Fasting blood samples were obtained from all the patients and were sent to central laboratory where an auto-analyzer and ELISA was used for assessing the CRP levels. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Mann-whiten U test was used for evaluation of level of significance. **Results:** Mean CRP levels among patients of group A and group B was found to be 401.8 pg/ml and 198.4 pg/ml respectively. On statistical analysis, it was observed that peri-implantitis patients had significantly higher levels of CRP in comparison to the healthy controls. **Conclusion:** Peri-implantitis patients had significantly higher levels of CRP highlighting their role in the pathogenesis of the disease.

Key words: Peri-implantitis, C reactive proteins

Received: 12 March, 2020

Accepted: 28 April, 2020

Corresponding author: Dr. Prabhdeep Kour, Dental Surgeon (Periodontist), Guru Nanak Mission Hospital, Jammu, India

This article may be cited as: Kour P, Oswal P, Nainee N, Pawashe Y. Assessment of C Reactive proteins levels in patients with peri-implantitis. J Adv Med Dent Sci Res 2020;8(6):52-54.

INTRODUCTION

Implant success and survival rates of up to 100% have been reported. Despite the predictable success of implants, complications and failures occur in a small percentage of cases. Peri-implant disease is a chronic inflammatory condition caused by bacterial plaque contamination. It can be classified as peri-implant mucositis, which is reversible inflammation confined to the soft tissue, or peri-implantitis, characterized by a progressive inflammatory response that leads to alveolar bone loss. Clinical signs of peri-implantitis that imitate chronic periodontitis include bleeding on probing (BOP), soft-tissue inflammation, increased probing depth (PD), pain, and suppuration. Although bacterial plaque is the primary factor in the etiology of peri-implantitis, microbial virulence factors such as lipopolysaccharides enhance the severity of inflammatory responses aided by cytokines released by host immune cells.¹⁻³

C reactive protein (CRP) is considered an acute-phase reactant and was shown to induce the expression of cellular adhesion molecules, thus mediating the adhesion of leukocytes to the vascular endothelium. CRP is associated with endothelial cell damage and it has been viewed as a marker of low-grade vascular inflammation. 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.⁴⁻⁶ Hence; the present study was conducted by assessing C Reactive proteins levels in patients with peri-implantitis.

MATERIALS & METHODS

The present study was conducted with the aim of assessing the levels of C Reactive proteins levels in patients with peri-implantitis. A total of 120 patients were enrolled and were broadly divided into two study groups with 60 patients in each group as follows:

Group A: Peri-implantitis patients

Group B: Healthy controls

Complete demographic details of all the patients were obtained. Fasting blood samples were obtained from all the patients and were sent to central laboratory where an auto-analyzer and ELISA was used for assessing the CRP levels. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Mann-whiten U test was used for evaluation of level of significance.

RESULTS

In the present study, a total of 60 patients with peri-implantitis and 60 healthy controls were enrolled. Peri-implantitis patients were designated as Group A and healthy controls were designated as Group B. Majority of the patients of both the study group belonged to the age group of more than 50 years. Higher proportion of males was present in both the study groups. In the present study, mean CRP levels among patients of group A and group B was found to be 401.8 pg/ml and 198.4 pg/ml respectively. On statistical analysis, it was observed that peri-implantitis patients had significantly higher levels of CRP in comparison to the healthy controls.

Table 1: Demographic data

Parameter		Group A	Group B
Age group (years)	Less than 30	12	15
	30 to 50	20	16
	More than 50	22	29
Gender	Males	31	35
	Females	29	25

Table 2: C Reactive proteins levels

C Reactive protein levels	Group A	Group B
Mean (pg/ml)	401.8	198.4
SD	99.7	52.2
Mann-Whitney U value	-1.336	
p-value	0.0001 (Significant)	

DISCUSSION

Periodontal disease (PD) is chronic infection induced by multiple bacteria and aggravated by host inflammatory response leading to a loss of periodontal connective attachment tissue and tooth support. The concept of PD influencing systemic health has been discussed over several decades. CRPs are acute phase reactant produced by liver in response to diverse inflammatory response. CRP level is the markers for systemic inflammation and is also associated with chronic bacterial infection like periodontitis. Evidence also shows that treating periodontal diseases seems to reduce serum CRP levels. Raised CRP level has also been associated with adverse pregnancy outcome such

as preterm birth (PTB), low birth weight (LBW), preeclampsia, intrauterine growth restriction.⁷⁻⁹ Hence; the present study was conducted by assessing C Reactive proteins levels in patients with peri-implantitis.

In the present study, a total of 60 patients with peri-implantitis and 60 healthy controls were enrolled. Peri-implantitis patients were designated as Group A and healthy controls were designated as Group B. Majority of the patients of both the study group belonged to the age group of more than 50 years. Higher proportion of males was present in both the study groups. Amin Ur Rahman et al evaluated if dental implants placed after extractions in patients with end-stage periodontitis affect the serum CRP levels. Serum CRP levels in 10 subjects with end-stage periodontitis were measured prior to tooth extraction and placement of dental implants, and at 3-month intervals for a year post-operatively. Mean CRP levels decreased significantly following tooth extraction and replacement with dental implants from 3.45 to 1.55 mg/dl after 12 months (P < 0.01). Six-, 9-, and 12-month post-implant placement mean CRP values were statistically significantly different from the mean pre-operative CRP value (P < 0.01). The pilot data suggested that extraction of advanced periodontally involved teeth and their replacement with dental implants lead to a decrease in CRP levels, and dental implant placement does not change the lowered CRP levels over a 12-month period.¹⁰

In the present study, mean CRP levels among patients of group A and group B was found to be 401.8 pg/ml and 198.4 pg/ml respectively. On statistical analysis, it was observed that peri-implantitis patients had significantly higher levels of CRP in comparison to the healthy controls. Fahim Vohra et al compared clinical and radiographic peri-implant inflammatory parameters in patients with different levels of obesity and correlate these parameters with CRP levels. Eighty-four patients who participated in this study were divided into 4 groups: class I obese (group 1), class II obese (group 2), class III obese (group 3), and nonobese individuals (group 4) were included. Clinical (plaque index [PI], bleeding on probing [BOP], probing depth [PD]) and radiographic (marginal bone loss [MBL]) peri-implant parameters were recorded. Serum CRP were quantified using enzyme-linked immunosorbent assay (ELISA). Clinical peri-implant parameters and serum CRP concentrations were analyzed using 1-way analysis of variance. 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 ($P = .0212$). Clinical and radiographic peri-implant inflammatory parameters and serum CRP were significantly high in patients with severe form of obesity.¹¹ Sudan S et al assessing the level of C reactive proteins in patients with peri-implantitis. A total of 10 patients with clinical and radiographic evidence of peri-implantitis and 10 healthy controls were enrolled in the present study. Complete demographic details of all the patients were obtained. Thorough clinical examination of all the patients was carried out. All the patients were recalled in the morning in and GCF (gingival crevicular fluid) samples were obtained. All the samples were sent to laboratory where auto-analyser was used for evaluation of serum C reactive proteins levels. Mean C reactive proteins levels among the patients of the peri-implantitis group and the control group were found to be 397.4 pg/mL and 188.9 pg/mL respectively. While comparing statistically, it was observed that mean C reactive proteins levels of the patients of the peri-implantitis group was found to be higher in comparison to the patients of the control group. Patients with peri-implantitis have raised levels of C reactive proteins.¹²

CONCLUSION

From the above results, the authors concluded that peri-implantitis patients had significantly higher levels of CRP highlighting their role in the pathogenesis of the disease.

REFERENCES

1. Sennerby L. Dental implants: matters of course and controversies. *Periodontol* 2000; 2008;47:9–14.
2. Peri-implant mucositis and peri-implantitis: a current understanding of their diagnoses and clinical implications. *J Periodontol*. 2013;84:436–443.
3. Zitzmann NU, Berglundh T, Marinello CP, et al. Experimental peri-implant mucositis in man. *J Clin Periodontol*. 2001;28:517–523.
4. Winkler S. Extraordinary implant failure. *J Oral Implantol*. 2010;36:391–400.
5. Park JH, Kim YS, Ryu JJ, et al. Cumulative survival rate and associated risk factors of Implantium implants: a 10-year retrospective clinical study. *J Adv Prosthodont*. 2017;9:195–199.
6. Sharma A, Ramesh A, Thomas B. Evaluation of plasma C-reactive protein levels in pregnant women with and without periodontal disease: A comparative study. *J Indian Soc Periodontol*. 2009;13:145–9.
7. Tarannum F, Faizuddin M. Effect of periodontal therapy on pregnancy outcome in women affected by periodontitis. *J Periodontol*. 2007;78:2095–103. [PubMed] [Google Scholar]
8. Sanz M, Chapple IL, Working Group 4 of the VIII European Workshop of Periodontology Clinical research on peri-implant diseases: consensus report of Working Group 4. *J Clin Periodontol*. 2012;39((suppl 12)):202–206.
9. Allen EM, Matthews JB, O'Halloran DJ, Griffiths HR, Chapple IL. Oxidative and inflammatory status in Type 2 diabetes patients with periodontitis. *J Clin Periodontol*. 2011;38:894–901
10. Amin Ur Rahman 1, Saqib Rashid, Rizwana Noon, Zeerak S Samuel, Bing Lu, Wenche S Borgnakke, Ray C Williams Prospective Evaluation of the Systemic Inflammatory Marker C-reactive Protein in Patients With End-Stage Periodontitis Getting Teeth Replaced With Dental Implants: A Pilot Investigation. *Clin Oral Implants Res*. 2005 Feb;16(1):128-31.
11. Fahim Vohra 1, Fahad Alkudhairy 2, Abdulaziz A Al-Kheraif 3, Zohaib Akram 4, Fawad Javed. 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.
12. Sudan S, Verma P, Bhagat P, Kohli S, Parmar U, Sahu A. Assessment of level of C reactive proteins in patients with peri-implantitis. *HECS Int J Comm Health Med Res* 2020; 6(1): 76- 78.