

Original ARTICLE

Assessment of level of C reactive proteins in patients with peri-implantitis

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ABSTRACT

Background: There are several kinds of biomarkers, which are associated with peri-implantitis. Detection of proteomics biomarkers could intuitively and accurately determine the survival of oral microbes and their responses to the environment changes, including the osteocalcin, alkaline phosphatase, matrix metalloproteinases (MMPs), and C-reactive protein (CRP). Hence; the present study was undertaken for assessing the level of C reactive proteins in patients with peri-implantitis. **Materials & methods:** 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. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. **Results:** 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. **Conclusion:** Patients with peri-implantitis have raised levels of C reactive proteins.

Key words: C reactive proteins, Peri-implantitis

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INTRODUCTION

Implant dentistry, as a scientific discipline, has grown rapidly over the last four decades with the aim of facilitating early and effective osseointegration affording successful long-term outcomes. Over these years, the onset of complications has been neglected as representing only isolated events. Nowadays, however, due to the increase in prevalence of such problems, one of the major endeavors in this field is the prevention and efficient management of biological complications referred to as peri-implant diseases.¹⁻³

There are several kinds of biomarkers, which are associated with peri-implantitis. Detection of proteomics biomarkers could intuitively and accurately determine the survival of oral microbes and their responses to the environment changes, including the osteocalcin, alkaline phosphatase, matrix metalloproteinases (MMPs), and C-reactive protein (CRP). Moreover, genetic

biomarkers have been shown to be associated with the pathogenesis of peri-implantitis, including the interleukin (IL), prostaglandin E2, CD14, lipopolysaccharide receptors, and osteoprotegerin.⁴⁻⁶ Hence; the present study was undertaken for assessing the level of C reactive proteins in patients with peri-implantitis.

MATERIALS & METHODS

The present study was undertaken with the aim of assessing and comparing the C reactive proteins levels 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. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi- square test and student t test were used for evaluation of level of significance.

RESULTS

In the present study, a total of 10 patients with peri-implantitis and 10 healthy controls were enrolled. Among the patients of the peri-implantitis group, there were 6 males and 4 females. Mean age of the patients of the peri-implantitis group was found to be 43.8 years. Among the patients of the control group, there were 5 males and 5 females. Mean age of the patients of the control group was found to be 44.7 years. 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.

Table 1: Demographic data

Parameter	Peri-implantitis group	Control group
Mean age (years)	43.8	44.7
Gender	Males	6
	Females	4
	5	5

Table 2: Comparison of C Reactive proteins levels

Parameter	Peri-implantitis group	Control group
Mean (pg/mL)	397.4	188.9
SD	53.8	27.4
t-value	-1.856	
p- value	0.00 (Significant)	

DISCUSSION

The name peri-implant disease refers to the pathological inflammatory changes that take place in the tissue surrounding a load-bearing implant. Two entities are described within the concept of peri-implant disease: peri-implant mucositis and peri-implantitis. Peri-implant mucositis is defined as a reversible inflammatory reaction in the soft tissues surrounding an implant. Peri-implantitis is an inflammatory reaction with loss of supporting bone in the tissues surrounding an implant.^{6,7}

The conversion process from peri-implant mucositis mirrors the progression from gingivitis to periodontitis, with the constant formation of plaque features in the peri-implant tissues, characterized by erythema, bleeding, exudation, and tumefaction. At histological level, the establishment of B- and T-cell-dominated inflammatory cell infiltrates has been evidenced. However, the clinical and histopathological characteristics during the conversion process are still not fully clear. Following conversion, peri-implantitis progresses in a nonlinear and accelerated manner.^{8,9} Hence; the present study was undertaken for assessing the level of C reactive proteins in patients with peri-implantitis.

In the present study, among the patients of the peri-implantitis group, there were 6 males and 4 females. Mean age of the patients of the peri-implantitis group was found to be 43.8 years. Among the patients of the control group, there were 5 males and 5 females. Mean age of the patients of the control group was found to be 44.7 years. Vohra F 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). 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).¹⁰

In the present study, 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. Gao X et al compared the biomarkers in the gingival crevicular fluid between the Han and Uygur subjects with healthy implants and peri-implantitis. Totally 80 subjects were divided into the H-case (Han patients with peri-implantitis), U-case (Uygur patients with peri-implantitis), H-control (Han subjects with healthy implants), and U-control (Uygur subjects with healthy implants) groups. The matrix metalloproteinase (MMP)-13 level in the gingival crevicular fluid in the U-control group was significantly higher than the H-control group, whereas the C-reactive protein level in the H-control group was significantly higher than in the U-control group. No significant difference was observed in the dominant subgingival bacteria species between the H- and U-control groups. The levels of interleukin (IL)-1β and MMP-8 were significantly higher in the H-case group than the U-case group, whereas the IL-17A level in the U-case group was significantly higher. The shared dominant subgingival bacteria species of the case groups mainly included Prevotella, clostridium, Porphyromonas, treponema, Streptococcus, neisseria, and hemophilus. Moreover, Acinetobacter, Micrococcus, and Moraxella were found to be the specific dominant subgingival bacteria species for the U-case group. In addition, compared with the H-case group, the IL-1β levels were negatively correlated with Acinetobacter, Micrococcus, and Moraxella in the U-case group.¹¹ Megson E et al determined whether CRP in GCF is produced locally in the gingivae. Gingivae and GCF were collected from non-periodontitis and periodontitis sites. Presence of CRP in gingivae was assessed by immunohistochemistry. CRP in GCF was measured using ELISA. Gene expression for CRP in gingivae was determined using real-time polymerase chain reaction. CRP was found in both the gingivae and GCF. No gingivae had detectable amounts of CRP mRNA. Not all patients with periodontitis had detectable levels of CRP in the GCF. Some non-periodontitis patients had detectable levels of CRP in the GCF. CRP in the GCF appears to be of systemic origin, and therefore may be indicative of systemic inflammation from either a periodontal infection or inflammatory disease elsewhere.¹²

CONCLUSION

From the above results, the authors concluded that patients with peri-implantitis have raised levels of C reactive proteins. However; further studies are recommended.

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