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Assessment of C reactive proteins levels in patients with dental implant failure

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Abstract---Background: The present study was undertaken for assessing C reactive proteins levels in dental implant failure patients. Materials & methods: A total of 100 patients who were schedule to undergo prosthetic rehabilitation of missing mandibular molars were enrolled. Baseline hematological and biochemical variables were evaluated. All the dental implant procedures were carried out under adequate septic conditions. All the patients were put of prescribed antibiotic therapy postoperatively. All the patients were evaluated radiographically after three months for prognosis. C Reactive proteins levels were evaluated in all the patients and were compared between patients on the basis of prognosis. All the results were recorded in

Microsoft excel sheet and were subjected to statistical analysis using SPSS software. Results: Mean C Reactive proteins levels among patients with Dental implant failure and among patients with successful dental implants was 0.89 mg/dL and 0.21 mg/dL respectively. Significant results were obtained while comparing the C Reactive proteins levels among patients with Dental implant failure and among patients with successful dental implants. Conclusion: C Reactive proteins could be used as a successful marker for monitoring the success dental implant therapy.

Keywords--C reactive proteins, implants, dental.

Introduction

A dental implant is a structure made of alloplastic materials implanted into the oral tissues beneath the mucosa and/or periosteum and/or within or through the bone to provide retention and support for a fixed or removable dental prosthesis. Implant dentistry the second oldest dental profession; exodontia (oral surgery) is the oldest. Around 600 AD, the Mayan population used pieces of shells as implants to replace mandibular teeth. A proper knowledge of anatomical landmarks and its variations prior to implant placement is indispensable to ensure a precise surgical procedure and safeguard the patient against iatrogenic complications. The precise evaluation of distinct anatomical factors such as the position of the mandibular canal, maxillary sinus, the width of the cortical plates, the existing bone density, etc. is very important in appropriate implant selection and planning the most appropriate implant position in the existing clinical condition.^{1- 3} The branch of dental implantology has shown enormous advancements in past years with the target of providing reasonable osseointegration which would provide efficacious outcome. During the time of initiation of any complication has been disregarded as a few sporadic events. However, with an increase in the cases of peri-implantitis of late, a plethora of steps are being undertaken with the aim of avoiding and preventing any such biological management.^{4- 6}

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. Raised levels of interleukin (IL-6) have been demonstrated by various studies which tend to decrease with suitable periodontal treatment. IL-6 stands out to be the chief pro-coagulant cytokine. Moreover, it also leads to the induction of CRP expression which further stimulates the responses of the pro-coagulants and mediators of inflammation.^{6- 8} Hence; the present study was undertaken for assessing C reactive proteins levels in dental implant failure patients.

Materials and Methods

The present study was undertaken for assessing C reactive proteins levels in dental implant failure patients. A total of 100 patients who were schedule to undergo prosthetic rehabilitation of missing mandibular molars were enrolled.

Baseline hematological and biochemical variables were evaluated. All the dental implant procedures were carried out under adequate septic conditions. All the patients were put of prescribed antibiotic therapy postoperatively. All the patients were evaluated radiographically after three months for prognosis. C Reactive proteins levels were evaluated in all the patients and were compared between patients on the basis of prognosis. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

Results

A total of 100 patients were evaluated. Mean age of the patients was 39.8 years. Out of 100 patients, dental implant failure occurred in 11 patients. Mean C Reactive proteins levels among patients with Dental implant failure and among patients with successful dental implants was 0.89 mg/dL and 0.21 mg/dL respectively. Significant results were obtained while comparing the C Reactive proteins levels among patients with Dental implant failure and among patients with successful dental implants.

Table 1: Comparison of C Reactive proteins levels

| C Reactive proteins levels (mg/dL) | Successful dental implant | Dental implant failure | p- value |
|------------------------------------|---------------------------|------------------------|---------------------|
| Mean | 0.89 | 0.21 | 0.004 (Significant) |
| SD | 0.36 | 0.12 | |

Discussion

Dental implantation is a surgical process of the jaw bone to support a crown, bridge, denture, and facial prosthesis. The basis of modern dental implantations is called osseointegration, it is the direct structural and functional connection between living bone and the surface of a load-bearing implant. Osteointegrated implants have been used to treat various condition ranging from edentulism to head and neck reconstruction. Dental implants are used to facilitate retention of auricular mandibular, maxillary, nasal, and orbital implants, and for bone-anchored hearing aids. The implant fixture is first placed so as to osseointegrate, and then a dental prosthesis is added. A variable amount of healing time is required for osseointegration before a crown, denture, or abutment is placed which will hold a dental prosthesis. Conventional implant practice dictates a delay between tooth extraction and implant placement, dividing the treatment into two differenced steps. The success or failure of implants depends on the overall health of the patient and also drugs which interfere with bone metabolism, have adverse effect on the osseointegration. Hence; the present study was undertaken for assessing C reactive proteins levels in dental implant failure patients.

A total of 100 patients were evaluated. Mean age of the patients was 39.8 years. Out of 100 patients, dental implant failure occurred in 11 patients. Mean C Reactive proteins levels among patients with Dental implant failure and among patients with successful dental implants was 0.89 mg/dL and 0.21 mg/dL

respectively. Fahim Vohra assessed C reactive protein levels in peri-implantitis patients. 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 and radiographic peri-implant inflammatory parameters and serum CRP were significantly high in patients with severe form of obesity. Serum CRP levels correlated with peri-implant bleeding in obese patients.¹⁰

Significant results were obtained while comparing the C Reactive proteins levels among patients with Dental implant failure and among patients with successful dental implants. 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. Univariate repeated measures analysis of variance was used to estimate and test the changes in CRP levels over time. 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.¹¹

Conclusion

C Reactive proteins could be used as a successful marker for monitoring the success dental implant therapy.

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