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ORIGINAL RESEARCH

Analysis of the prevalence and risk indicators of peri-implantitis

Satvik Kulkarni[1], Pratima Oswal[2], Mansi Kulkarni[3], Supriya Sawant[4], Ancia Vas[5], Ketaki Rajguru[6]

[1]Assistant professor, Department of Prosthodontics, Bharti Vidyapeeth Dental College and Hospital, Sangli;
[2]Sr. Lecturer, Dept of Periodontology, Tatyasaheb Kore Dental College, Kolhapur;
[3]Assistant professor, Department of Pediatrics and Preventive Dentistry, Bharti Vidyapeeth Dental College and Hospital, Sangli;
[4,6]PG student, Department of Conservative and Endodontics, Tatyasaheb Kore Dental College, Kolhapur;
[5]Private Practitioner, Goa

ABSTRACT:

Background: Studying the prevalence of peri-implant disease and investigating the roles played by the vast array of associated risk factors in the onset and progress of peri-implantitis is of crucial importance for the development of dental-implant management programs and the establishment of peri-implantitis prevention and treatment protocols. This study was conducted with the purpose of identifying and analysing the prevalence and risk indicators of peri-implantitis. **Materials and methods:** 200 patients were selected for this study who had received single or multiple dental implants as a treatment option for missing teeth. Clinical assessment included pocket depth and bleeding on probing measurements. Presence of bleeding on probing and a pocket depth of more than 5 mm was considered to indicate inflammation around implant. Predisposing factors like smoking and diabetes were also considered. Data about the patients' medical history was also collected and used to analyse any relation of these predisposing factors on peri implant inflammation. **Results:** The percentage of patients with peri-implantitis was 7.5%. Amongst the prevalent cases of peri-implantitis, the effect of age, gender, presence of diabetes and risk of smoking in development of inflammation around the implants were assessed. It was found that geriatric age had a statistically significant effect on the occurrence of peri-implantitis. **Conclusion:** This study concluded that peri-implantitis is not an uncommon finding in patients undergoing implant therapy and its prevalence cannot be overlooked. Although gender of the patient did not predispose to peri-implantitis, but geriatrics, history of diabetics and smoking definitely act as risk factors to the development of the same.

Key words: Peri-implantitis, implant, diabetes, geriatric.

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Corresponding author: Dr. Satvik Kulkarni, Assistant professor, Department of Prosthodontics, Bharti Vidyapeeth Dental College and Hospital, Sangli

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INTRODUCTION

Implant-supported restoration has a high success rate over long-term follow-up periods. It has now been recognized as a predictable and reliable treatment option for replacing missing teeth. However, biological complications, including peri-implant diseases (i.e., peri-implant mucositis and peri-implantitis), along with technical complications, have emerged as follow-up periods have been extended.[1]

Despite a high overall success rate, various risk factors can negatively affect the predictability of dental implants, leading to peri-implant tissue inflammation, bone resorption and, ultimately, to implant loss.[2] Peri-implantitis was first defined as "inflammatory reactions with loss of supporting bone in the tissues surrounding a functioning implant". [3] Studying the prevalence of peri-implant disease and investigating the roles played by the vast array of

associated risk factors in the onset and progress of peri-implantitis is of crucial importance for the development of dental-implant management programs and the establishment of peri-implantitis prevention and treatment protocols.[4] A number of risk factors for peri-implantitis have been identified in the literature, ranging from microbial biofilm retentive elements associated with the design of the implant-supported prosthesis, to systemic predispositions and environmental exposures such as pre-existing periodontitis or cigarette smoking.[5] This study was conducted with the purpose of identifying and analysing the prevalence and risk indicators of peri-implantitis.

MATERIAL AND METHODS

This study was conducted with the purpose of identifying and analysing the prevalence and risk indicators of peri-implantitis. 200 patients were selected for this study who had received single or multiple dental implants as a treatment option for missing teeth. Minimum follow up period of 5 years was considered as a selection criteria for patients. Based on age, all the patients were divided into 3 groups:

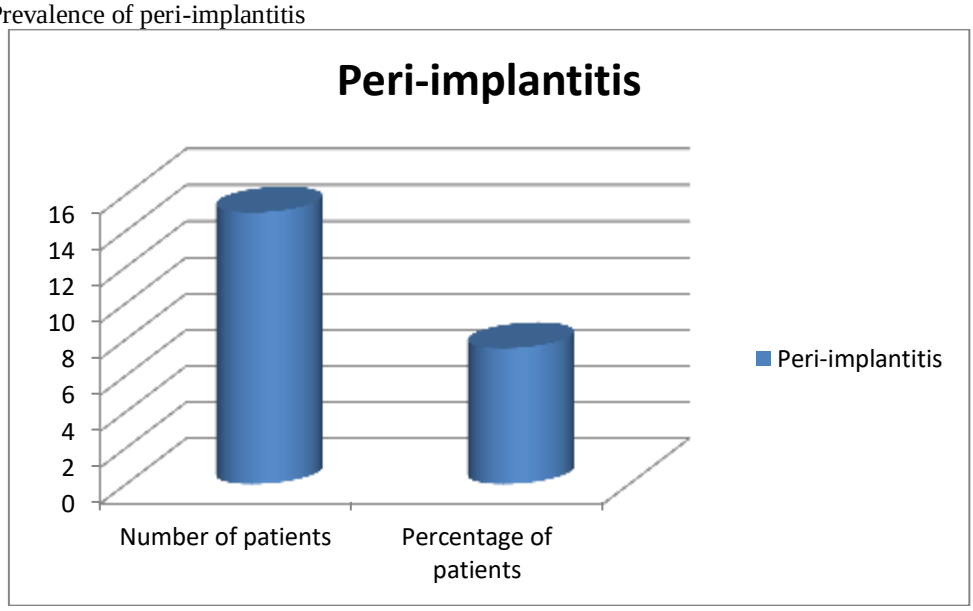
Group 1: Age of patient between 25-40 years
Group 2: Age of patient between 41-60 years
Group 3: Age of patient > 60 years.

A retrospective data collection of all patients was done. Preoperative and immediate postoperative radiographs of the patients were collected. A latest radiograph was also taken on the recall appointment to compare the bone levels with immediate post implant placement phase. Radiographic and clinical assessment was selected as a basis to assess peri-implantitis. A vertical bone loss of more than 3 implant threads on the mesial and distal side of the implant as compared between the immediate post-op and latest radiograph was considered to be an indicator of implant disease and peri-implant inflammation. Clinical assessment included pocket depth and bleeding on probing measurements. Presence of bleeding on probing and a pocket depth of more than 5 mm was considered to indicate inflammation around implant. Predisposing factors like smoking and diabetes were also considered. Data about the patients' medical history was also collected and used to analyse any relation of these predisposing factors on peri implant inflammation. All the data was then assembled and statistically analysed using SPSS software. Chi-square test was used for statistical analysis. P value of less than .05 was considered significant.

RESULTS

In the current study, a sample of 200 patients was observed to check signs of peri-implantitis. It was found that out of 200 patients, 15 patients demonstrated peri-implant inflammation. The percentage of patients with peri-implantitis was 7.5% (Graph 1).

Graph 1: Prevalence of peri-implantitis



Amongst the prevalent cases of peri-implantitis, the effect of age, gender, presence of diabetes and risk of smoking in development of inflammation around the implants were assessed. It was found that geriatric age had a statistically significant effect on the occurrence of peri-implantitis. Out of the 15 patients, 8 patients showing signs of peri-implantitis belonged to age group of more than 60 years. Gender did not show any significant predilection in development of peri-implantitis. Out of the 15 patients with peri-implantitis, 8 were males and rest 7 were females (Table 1).

Table 1: Risk factors for peri-implantitis

Parameter		Number of peri-implantitis patients	Percentage of patients	p- value
Age group (years)	25-40 years	2	13.33%	.047
	41-60 years	5	33.33%	
	> 60 years.	8	53.33%	
Gender	Males	8	53.33%	.093
	Females	7	46.67%	
Diabetic status	Present	12	80%	.016
	Absent	3	20%	
Smoking habit	Smokers	11	73.33%%	.03
	Non-smokers	4	26.67%	

Patients who were diabetic showed a statistically significant relation to development of peri-implantitis (P-value= .016). 12 out of the 15 patients with peri-implantitis were diabetics. Smoking also proved to be a significant risk factor for the occurrence of peri-implantitis. Out of the 15 patients with peri-implant inflammation, 11 were found to be chronic smokers. This relation was statistically significant (P-value=.03).

DISCUSSION

Over the last decades, the use of implant-supported dental rehabilitations has known a significant increase[6]. Despite a high overall success rate, various risk factors can negatively affect the predictability of dental implants, leading to peri-implant tissue inflammation, bone resorption and, ultimately, to implant loss. Among them, history of periodontal disease and smoking habits have often been identified as conditions favouring the onset of peri-implant pathologies[7-8.] According to the American Academy of Periodontology, peri-implantitis is 'an inflammatory process around an implant that includes both soft tissue inflammation and loss of supporting bone'. [9]

Various risk factors for peri-implantitis have been evaluated in the literature. They are mainly categorized as implant- or patient-related factors and as systemic or local factors[10]. Implant surface design, implant position and angulation, and prosthesis design in terms of performing plaque control have been suggested as implant-related/local factors while a history of periodontitis and smoking are the most frequently analyzed patient-related/systemic factors associated with peri-implantitis [11-12].

In the current study, a sample of 200 patients was observed to check signs of peri-implantitis. It was found that out of 200 patients, 15 patients demonstrated peri-implant inflammation. The percentage of patients with peri-implantitis was 7.5% (Graph 1). Alexandra Marrone et al evaluated prevalence and risk factors for peri-implant disease in Belgian adults. They found that the prevalences of mucositis and peri-implantitis at the patient's level were respectively 31% and 37%. They were 38% and 23% at the implant's level. Subjects older than 65 years (OR = 1.39) and those with active periodontitis (OR = 1.98) were prone to peri-implantitis. The association was stronger for hepatitis (OR = 2.92) and totally edentulous patients (OR = 5.56). Finally, at the implant's level, a significant correlation was found in the multi-level analyses between rough surfaces, overdentures and peri-implantitis.[13]

In the current study, amongst the prevalent cases of peri-implantitis, the affect of age, gender, presence of diabetes and risk of smoking in development of inflammation around the implants were assessed. It was found that geriatric age had a statistically significant effect on the occurrence of peri-implantitis. Out of the 15 patients, 8 patients showing signs of peri-implantitis belonged to age group of more than 60 years. Gender did not show any significant predilection in development of peri-implantitis. Out of the 15 patients with peri-implantitis, 8 were males and rest 7 were females (Table 1). Yorimasa Ogata et al investigated the prevalence's and risk factors for peri-implant diseases in Japanese adult dental patients attending a follow-up visit at dental hospitals or clinics as part of their maintenance program. Patients with implants with at least 3 years of loading time were included in the study. The condition of peri-implant tissue was examined and classified into the following categories: healthy, peri-implant mucositis, and peri-implantitis. Patients were also evaluated for implant risk factors. A total of 267 patients (110 men, 157 women; mean age: 62.5 ± 10.7 years) were analyzed. The prevalence of patient-based peri-implant mucositis was 33.3% (n = 89), and the prevalence of peri-implantitis was 9.7% (n = 26). Poor oral hygiene and a history of periodontitis were strong risk factors for peri-implant disease. The present prevalence's were lower than those previously reported. The quality of periodontal therapy before and after implant installation and patient compliance and motivation, as indicated by plaque control level, appear to be important in maintaining peri-implant tissue health.[14]

This study found that the patients who were diabetic showed a statistically significant relation to development of peri-implantitis (P-value= .016). 12 out of the 15 patients with peri-implantitis were diabetics. Smoking also proved to be a significant risk

factor for the occurrence of peri-implantitis. Out of the 15 patients with peri-implant inflammation, 11 were found to be chronic smokers. This relation was statistically significant (P-value=.03). S D Ferreira et al verified the prevalence of peri-implant disease and analyse possible risk variables associated with peri-implant mucositis and peri-implantitis. The implants placed were examined clinically and radiographically to assess the peri-implant status. The degree of association between peri-implant disease and various independent variables was investigated using a multinomial regression analysis. The prevalence of peri-implant mucositis and peri-implantitis were 64.6% and 8.9%, respectively. In univariate modelling, healthy peri-implant subjects presented lower plaque scores, less periodontal bleeding on probing, and less time elapsed since placement of supra-structures. In multivariate analyses, the risk variables associated with increased odds for having peri-implant disease included: gender, plaque scores, and periodontal bleeding on probing. Presence of periodontitis and diabetes were statistically associated with increased risk of peri-implantitis. The only two factors, which did not contribute to the presence of the disease, were the time elapsed since placement of supra-structures and the frequency of visits for maintenance care.[15]

CONCLUSION

This study concluded that peri-implantitis is not an uncommon finding in patients undergoing implant therapy and its prevalence cannot be overlooked. Alhough gender of the patient did not predispose to peri-implantitis, but geriatrics, history of diabetics and smoking definitely act as risk factors to the development of the same.

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