



To determine the prevalence and risk factors of peri-implantitis

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ABSTRACT

Aim: To determine the prevalence and risk factors of peri-implantitis

Material and methods: This research comprised 120 patients who had had a missing tooth replacement in the form of a dental implant at least 2 years previous to the start of the trial.

Their clinical and radiological information from before and after therapy were obtained. A new radiograph and the current clinical state of and around the implant equipment were assessed and documented during recall consultations. Radiographic and clinical evaluations were used to determine the prevalence of peri-implantitis.

Results: According to the data gathered, 20 of the 120 patients involved in this research had peri-implantitis. Periodontitis was diagnosed in 16.67% of patients. 14 of the 20 individuals who developed peri-implantitis also had a history of periodontitis. With a P-value of 0.02, this was statistically significant. The surface of the implant, on the other hand, did not represent a considerable risk of peri-implantitis development. The hybrid design implants accounted for 60% of peri-implantitis cases, whereas totally etched implants accounted for 40%.

Conclusion: According to the results of the current research, peri-implantitis is caused by several causes, and its incidence may be lowered by careful treatment planning that takes into account these predisposing elements.

Keywords: dental implant, peri-implantitis, dual acid etch, diabetes

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INTRODUCTION

Oral rehabilitation using dental implants for individuals who are either partly or fully edentulous is becoming a common practise. Dental implants have a very high success and survival rate, however they are nevertheless not without risk of early and late failures. Early failures have been linked to poor surgical technique, slowed healing, and uneven occlusal load distribution. Peri-implantitis infection and occlusal overload have been linked to late implant failures.¹ The lack of standardised diagnostic criteria has

had a significant impact on the current understanding of peri-implantitis' epidemiology.² Periodontal and peri-implant diseases and disorders were recently reclassified.³ This helped define the diagnostic parameters of these diseases, which would improve the reliability of future research and speed up the process of diagnosing and treating them. Inflammation of the peri-implant tissues, followed by gradual bone loss, is a hallmark of peri-implant diseases. People who have a history of periodontal disease and have trouble



keeping plaque under control are more likely to develop this condition.³ To put it another way, peri-implant mucositis is an inflammatory condition that can be reversed in the soft tissues surrounding implants. Substantial evidence suggests that plaque is the causative factor in peri-implantitis. Bleeding on probing and other outward manifestations of inflammation are hallmarks of this condition.³

Implants placed in the jawbone have become a popular method of tooth replacement. However, in recent decades, there has been a rise in the prevalence of patients showing signs of inflammation in the tissues around their implants. Inflammation of the peri-implant tissue is a frequent problem in the bone and soft tissue that surround implants. Inflammation of the gum tissue around dental implants, called peri-implant mucositis, is caused by bacterial plaque but may be treated. Soft tissues around an implant may become inflamed and bleed easily when prodded, although bone loss is not a symptom.⁴ Unlike natural teeth, dental implants are permanently exposed to the oral microbiota because they perforate the mucosa. Plaque-forming biofilms may develop on the surface of dental implant fixtures when oral bacteria colonise them.⁵

Bone resorption and soft tissue inflammation characterise the progressive condition known as peri-implantitis, which develops surrounding the implant. Resorption leading to bone loss due to a biological problem should be differentiated from the dynamic bone resorption that happens as a result of bone remodelling after osseointegration and stress.⁶ Risk factors for peri-implantitis have been found in the literature, and they range from the presence of microbial biofilm retentive features in the design of the implant-supported prosthesis to systemic predispositions and environmental exposures such as periodontitis and smoking.⁷ Since peri-implantitis therapy may be time-consuming,

difficult, and expensive, preventing the condition appears like a good way to boost implant success rates.⁸

MATERIAL AND METHODS

This research comprised 120 patients who had had a missing tooth replacement in the form of a dental implant at least 2 years previous to the start of the trial. The current clinical study sought to determine the prevalence of peri-implantitis and the risk factors associated with it. The patients' full demographic information was acquired. Patients were separated into two groups based on their ages: Group 1 (20-40 years) and Group 2 (40-60 years).

Their clinical and radiological information from before and after therapy were obtained. A new radiograph and the current clinical state of and around the implant equipment were assessed and documented during recall consultations. Radiographic and clinical evaluations were used to determine the prevalence of peri-implantitis. Peri-implantitis was defined as bone loss up to the fourth implant thread. Similarly, a pocket depth more than 4mm and the presence of blood on gingival probing were utilised to diagnose peri-implantitis. Various predisposing variables and their effect on the development of peri-implantitis, such as the surface of the dental implant, previous history of periodontitis prior to implant surgery, smoking, and diabetes history, were also evaluated. All of the implants utilised in these patients were dual acid-etched (DAE). Based on the design specification the DAE implants were categorised into two groups:

- Hybrid design implants: DAE surface includes all areas from the apex to the top of the third coronal thread. From here to seating platform was a machined surface.
- Fully etched implants: DAE surface from the apex to the seating platform.

All the assimilated data was recorded in Microsoft excel sheets. The data was



statistically analysed by using SPSS software. Chi-square test was used for statistical analysis. P value of less than .05 was considered significant.

RESULTS

The present clinical investigation was designed to assess the prevalence of peri-implantitis and the risk factors related with it. According to the data gathered, 20 of the 120 patients involved in this research had peri-implantitis. Periodontitis was diagnosed in 16.67% of patients. According to the data gathered, elderly age was a substantial risk factor for the development of peri-implantitis. Twelve of the twenty patients with peri-implantitis were between the ages of 40 and 60 (60%). The remaining peri-implantitis patients (40%) were from the 20-40 year age

range. Gender, on the other hand, did not found to be a major risk factor for peri-implantitis development (table 1). Diabetes and smoking were both identified as major risk factors. Diabetes and a history of smoking were found in 70% and 65% of the patients who had peri-implantitis, respectively. This link was found to be statistically significant (table 1). 14 of the 20 individuals who developed peri-implantitis also had a history of periodontitis. With a P-value of.02, this was statistically significant. The surface of the implant, on the other hand, did not represent a considerable risk of peri-implantitis development. The hybrid design implants accounted for 60% of peri-implantitis cases, whereas totally etched implants accounted for 40%. (Table 2).

Table 1: Predisposing factors for development of peri-implantitis

Age	peri- implantitis patients		peri- implantitis Absents		Total	P value
	Number	Percentage	Number	Percentage		
20-40	8	40	52	52	60	0.42
40-60	12	60	48	48	60	
Gender						0.65
Male	11	55	60	60	71	
Female	9	45	40	40	49	
Diabetic status						0.22
yes	14	70	45	45	59	
no	6	30	55	55	61	
Smoking habit						0.37
yes	13	65	57	57	70	
no	7	35	43	43	50	
Previous history of periodontitis						0.02
yes	14	70	61	61	75	
no	6	30	39	39	45	

Table 2 Surface of implant

Surface of implant	peri- implantitis patients		peri- implantitis Absents		Total	0.74
	Number	%	Number	%		
Hybrid design implants	12	60	60	60	72	
Fully etched implants	8	40	40	40	48	



DISCUSSION

Oral implants are now routinely used as part of preventative dentistry. Partial edentulous individuals are a common candidate for oral implants because of their success in replacing single or multiple lost teeth.⁹ There are two infectious diseases that might compromise functioning osseointegrated implants: peri-implant mucositis, which affects the peri-implant soft tissues, and peri-implantitis, which also causes bone loss in the peri-implant area.^{10,11} Peri-implant inflammation may have far-reaching effects, so it's important to learn more about its causes and how to avoid or manage it. The symptoms of peri-implant disorders include pain, the need for invasive procedures or prolonged recovery times after less invasive ones, increased healthcare expenditures, potential harm to the patient's overall health, and even implant failure.^{12,13}

The purpose of this clinical investigation was to assess the frequency of peri-implantitis and its accompanying dangers. According to the results, 20 of the 120 individuals studied ended up with peri-implantitis. 16.67% of patients were diagnosed with periodontitis. With the goal of estimating the incidence of peri-implantitis and identifying potential risk factors for its development in patients treated with oral implants, Claudio Marcantonio et al. undertook a research. It has been shown that the prevalence of peri-implantitis varies greatly depending on the diagnostic criteria used to characterise it. At the level of the implant, the prevalence is anything from 4.7% to 43.0%, while at the level of the individual patient, it may be anywhere from 8.9% to well over 56 percent. It has been hypothesised that a variety of risk factors contribute to the development and worsening of peri-implantitis. Evidence suggests that periodontitis, both current and past, might increase the likelihood of implant failure due to peri-implantitis. More caution is needed when placing dental implants in smokers,

despite the fact that cigarette smoking has not been definitively linked to peri-implantitis. More research is needed into other risk factors such as diabetes, hereditary characteristics, implant surface roughness, and the presence of keratinized mucosa. They came to the conclusion that peri-implantitis was a very prevalent problem after implant treatment. Patients with periodontal disease, either current or past, and smokers have been shown to have a greater incidence of peri-implantitis. There has not been a single definitive risk factor identified for peri-implantitis. Oral implant treatments may only be considered successful in the long run if they are accompanied with a preventative care plan.¹⁴

Older age was shown to be a major risk factor for the emergence of peri-implantitis, according to the results of this investigation. Twelve of the twenty patients diagnosed with peri-implantitis were seniors (aged 40 to 60), constituting 60% of the total. Forty percent of peri-implantitis cases were seen in people aged 20 to 40. However, it was shown that gender was not a major risk factor for peri-implantitis. Two major contributors to increased mortality were diabetes and tobacco use. Patients with peri-implantitis were more likely to have diabetes and a smoking history, with both being present in 70% of cases. The statistical significance of this connection was high. Pjetursson et al. looked at the incidence of peri-implantitis in periodontitis-prone individuals with a follow-up ranging from three to twenty-three years. Patients with PD 5 mm had a prevalence of peri-implantitis of 38.6%, whereas implant implantations showed a frequency of 22.2%. Peri-implantitis affected 8.8 and 17.1 percent of implants and patients when PD was set at 6 mm. Patients who participated in an effective supportive periodontal therapy programme had a lower rate of peri-implant disease than those who did not; and the incidence of peri-implantitis was significantly related to the



presence of persistent residual pockets (PD 5 mm) following completion of the maintenance programme.¹⁵

Fourteen of the twenty patients diagnosed with peri-implantitis had suffered from periodontitis in the past. The P-value for this was.02, making it statistically significant. However, the implant's surface did not significantly increase the likelihood of peri-implantitis. Nearly two-thirds (60%) of peri-implantitis cases had implants with a hybrid design, whereas nearly a third (40%) used totally etched implants. Peri-implantitis rates were evaluated between totally acid-etched implants and hybrid implants by Zetterqvist et al (implants with only the apical and the mid-third portions acid-etched). Over the course of the 5-year follow-up period, the prevalence of peri-implantitis was 0.37 percent overall, and there was no statistically significant difference between the totally acid-etched group and the hybrid group.¹⁶

CONCLUSION

According to the results of the current research, peri-implantitis is caused by several causes, and its incidence may be lowered by careful treatment planning that takes into account these predisposing elements. We urge more research on this topic.

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