Original Research

Assessment of risk factors of peri- implantitis in study population

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ABSTRACT:
Background: Peri-implantitis affects both soft and hard tissue and is characterized with progressive loss of alveolar bone. There is growing interest for researchers to investigate the peri-implant diseases including both peri-implant mucositis and peri-implantitis because of increasing high prevalence. The present study was conducted to assess cases of peri- implantitis in study population. **Materials & Methods:** 180 patients of both gender who received dental implants in last 5 years were enrolled. The assessment of probing pocket depths (PPD) and bleeding on probing (BOP) was done. PPD were ascertained at six sites. Risk factors were also noted. **Results:** Out of 180, males were 100 and females were 80. Out of 180 teeth, 60 (33.3%) had peri- implantitis. Common risk factors were smoking in 8, diabetes mellitus in 10, chronic periodontitis in 38 and bruxism in 4 cases. The difference was significant (P< 0.05). **Conclusion:** Common risk factors for peri- implantitis was smoking, diabetes mellitus, chronic periodontitis and bruxism.
Key words: Bruxism, Chronic periodontitis, Peri- implantitis

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] Peri-implantitis was first defined as "inflammatory reactions with loss of supporting bone in the tissues surrounding a functioning implant". The outcomes of various treatment approaches for peri-implantitis are not always successful or predictable.[2]

Peri-implant mucositis is identified as an inflammatory state which only affects soft tissue around implants.[3] On the other hand, peri-implantitis affects both soft and hard tissue and is characterized with progressive loss of alveolar bone. There is growing interest for researchers to investigate the peri-implant diseases including both peri-implant mucositis and peri-implantitis because of increasing high prevalence.[4]

Peri-implant diseases are initiated by microbial dental biofilm similarly to periodontal diseases including gingivitis and periodontitis.[5] Current literature supports that succesful treatment of periodontal diseases can be achieved more handily; however, once the peri-implant supporting tissues are lost, then regeneration of soft and hard tissues could not be possible. Therefore, prevention of peri-implant diseases are more essential and important than treatment, to increase the success rate of the implant for long-term.[6] The present study was conducted to assess cases of peri- implantitis in study population.

MATERIALS & METHODS

The present study comprised of 180 patients of both gender who received dental implants in last 5 years. All were enrolled with their written consent.
Data such as name, age, gender etc. was retrieved from case history performa. The assessment of probing pocket depths (PPD) and bleeding on probing

(BOP) was done. PPD were ascertained at six sites (distobuccal, midbuccal, mesiobuccal, mesiooral, midoral, and distooral) around each implant with a pressure-calibrated probe and BOP was documented as present or absent for each probing pocket. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 180		
Gender	Males	Females
Number	100	80

Table I shows that out of 180, males were 100 and females were 80.

Table II Prevalence of peri- implantitis

| Total	Peri- implantitis	Percentage
180	60	33.3%

Table II shows that out of 180 teeth, 60 (33.3%) had peri- implantitis.

Table III Assessment of risk factors

Risk factors	Number	P value
Smoking	8	0.01
Diabetes mellitus	10	
Chronic Periodontitis	38	
Bruxism	4	

Table III, graph I shows that common risk factors were smoking in 8, diabetes mellitus in 10, chronic periodontitis in 38 and bruxism in 4 cases. The difference was significant (P< 0.05).

Graph I Assessment of risk factors
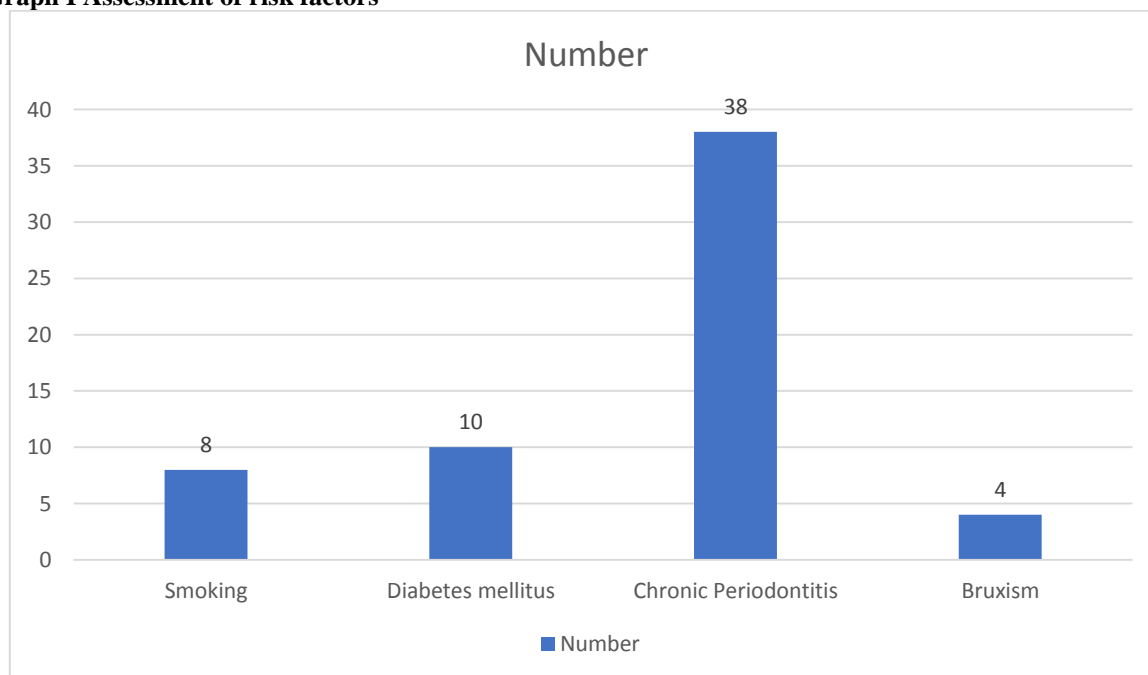
DISCUSSION

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.[7] 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.[8] Like supportive periodontal therapy (SPT) for the prevention of recurrent periodontal disease, regular maintenance therapy after implant placement has been emphasized as a way to prevent peri-implantitis. However, the prevalence of peri-implantitis in patients with a history of periodontal disease has not been evaluated in relation to SPT.[9] The present study was conducted to assess cases of peri- implantitis in study population.

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In present study, out of 180, males were 100 and females were 80. We found that 60 (33.3%) patients had peri- implantitis. Krebs et al[10] evaluated the prevalence of peri-implantitis (PI) and peri-implant mucositis (PM) in a long-term follow-up with comparison among different PI and PM definitions, and to report on the incidence of PI. Materials and Methods: In a retrospective clinical study five different PI and PM definitions were applied onto a population with 274 implants 17 to 23 years postimplant placement. Recommendations by the Eighth European Workshop on Periodontology (EWOP) were used as base reference. Clinical and radiological measurements were considered. Risk factors were evaluated in a regression analysis. After an average observation period of 18.9 years, 40.1% of the implants were diagnosed with PM and 15.0% with PI (Eighth EWOP). PI incidence reached 7.9% on implant level and 13.2% on patient level. Implants diagnosed with PI and progressive bone loss displayed exceptionally vertical bone defect configuration (BDC). Diabetes mellitus, smoking, regular maintenance, or a former periodontal infection did not show significant influence on the prevalence of peri-implant diseases. Patients with bruxism displayed significantly less PM and PI.

We found that common risk factors were smoking in 8, diabetes mellitus in 10, chronic periodontitis in 38 and bruxism in 4 cases. Goh et al[11] analyzed the prevalence and risk indicators of peri-implantitis in Korean patients with history of periodontal disease. A total of 444 patients with 1,485 implants were selected from patients. A group with a history of peri-implantitis (HP) (370 patients with 1,189 implants) and a group with a current peri-implantitis (CP) (318 patients with 1,004 implants) were created based on the radiographic and clinical assessments of implants. The prevalence of peri-implantitis was calculated at both the patient and implant levels. The influence of risk variables on the occurrence of peri-implantitis was analyzed using generalized estimating equations analysis. The prevalence of peri-implantitis in the HP and CP groups ranged from 6.7% to 19.7%. Among the patient-related risk variables, supportive periodontal therapy (SPT) was the only significant risk indicator for the occurrence of peri-implantitis in both groups. In the analysis of implant-related variables, implants supporting fixed dental prosthesis (FDP) and implants with subjective discomfort were associated with a higher prevalence of peri-implantitis than single implants and implants without subjective discomfort in the HP group. The presence of subjective discomfort was the only significant implant-related variable predictive of peri-implantitis in the CP group.

Gunpinar et al[12] determined the prevalence of peri-implant mucositis and peri-implantitis and to reveal the risk indicators associated with peri-implant diseases. Three hundred and eighty-two subjects who were treated with 1415 dental implants between 2011–2017 were clinically evaluated. Patients' medical and dental history, as well as implant details, were recorded. Peri-implant examination included probing pocket depth (PPD), bleeding on probing (BoP), plaque index (PI), gingival index (GI), and keratinized tissue width. Furthermore, the patient (sex, age, and smoking) and implant/prosthesis-related factors (surface characteristic, time in function, design of prosthesis etc.) were evaluated. Implants were classified into three groups: healthy, peri-implant mucositis, and peri-implantitis. 41.1% ($n = 157$) and 36.9% ($n = 84$) of patients had mucositis and peri-implantitis, respectively. 53.6% ($n = 758$) of implants (95%CI 80.2–90.4) had mucositis, and 21.7% ($n = 307$) had peri-implantitis. Patients with a maintenance < 2/year (OR = 2.576), having periodontitis (OR = 3.342) and higher PI (OR = 3.046) had significant associations with the development of peri-implant mucositis. Significant ORs were determined for peri-implantitis with patients having maintenance < 2/year (OR = 2.048), having number of implants ≥ 4 (OR = 2.103), diagnosed with periodontitis (OR = 3.295), and higher PI (OR = 7.055). Keratinized tissue width < 2 mm (ORs = 5389/8.013), PPD (ORs = 1.570/8.338), PI (ORs = 6.726/5.205), and BoP (ORs = 3.645/4.353) independent variables were significantly associated with both peri-implant mucositis and peri-implantitis at implant level, respectively.

CONCLUSION
Authors found that common risk factors for peri-implantitis was smoking, diabetes mellitus, chronic periodontitis and bruxism.

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