

ORIGINAL RESEARCH

Assessment of incidence of peri-implantitis in a known population

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ABSTRACT

Background: Dental implants have become an indispensable established therapy in dentistry in order to replace missing teeth in different clinical situations. When peri-implantitis prevalence is reported, the level of reporting must also be taken into consideration. Hence; the present study was conducted for assessing the incidence of peri-implantitis in a known population. **Materials & methods:** A total of 100 patients scheduled to undergo dental implant therapy for prosthetic rehabilitation of missing mandibular molar were enrolled. Complete demographic and clinical details of all the patients was obtained. Radiographic evaluation was done in all the patients. All the patients were screened with biochemical and hematological profile. Treatment planning was done based on radiographic analysis. All the patients underwent dental implant procedures using conventional technique. All the patients were recalled for follow-up. Follow-up records were maintained for 6 months to assess the incidence of peri-implantitis. **Results:** A total of 100 patients were analyzed. Mean age of the patients was 28.3 years. 65 percent of the patients were males while the remaining were females. Peri-implantitis was found to be present in 8 percent of the patients. Out of 8 patients with peri-implantitis, 5 were males while the remaining 3 were females. 3 patients were diabetic and 2 patients were found to be hypertensive. **Conclusion:** Biological problems do occur with implant therapy, even if it is a comprehensive course of care. Recalls for strict supportive care may result in early diagnosis and decreased incidence of peri-implantitis.

Key words: Peri-implantitis, Dental Implants

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INTRODUCTION

Dental implants have become an indispensable established therapy in dentistry in order to replace missing teeth in different clinical situations. Success rates of 82.9% after 16 years follow-up have been reported. In analogy to gingivitis and periodontitis affecting the periodontium of natural teeth, an inflammation and destruction of soft and hard tissues surrounding dental implants is termed as mucositis and peri-implantitis. Thereby, transitions are often fluent and not clinically clearly separable.¹⁻³

Although over the last decades dental implants proved to be highly effective in replacing teeth with survival rates exceeding 95% over 10 years, biological complications compromise implant longevity. Accordingly, there is an increase in the treatment needs to arrest such disorders. Over time, numerous disease definitions have been proposed and different clinical parameters have been defined. Consequently,

a wide range of prevalence have been reported and their results published in a systematic review with meta-analysis. Moreover, in a case series of 86 patients with a very long follow-up (i.e., range of 21–26 years), peri-implant mucositis and peri-implantitis prevalence amounted to 54.7% and 22.1%, respectively. In addition, it has to be differentiated between cases with baseline radiographs in which 1–1.5 mm of marginal bone loss has been proposed to define peri-implantitis and cases without baseline radiographs in which 2 mm of marginal bone loss after the initial remodeling phase account for the definition of peri-implantitis. When peri-implantitis prevalence is reported, the level of reporting (i.e., implant vs. patient) must also be taken into consideration. For example, the prevalence of peri-implantitis was reported to be 1% at patient— and 0.4% at implant-level, respectively.⁴⁻⁶ Hence; the

present study was conducted for assessing the incidence of peri-implantitis in a known population.

MATERIALS & METHODS

The present study was conducted for assessing the incidence of peri-implantitis in a known population. A total of 100 patients scheduled to undergo dental implant therapy for prosthetic rehabilitation of missing mandibular molar were enrolled. Complete demographic and clinical details of all the patients was obtained. Radiographic evaluation was done in all the patients. All the patients were screened with biochemical and hematological profile. Treatment planning was done based on radiographic analysis. All the patients underwent dental implant procedures using conventional technique. All the patients were recalled for follow-up. Follow-up records were maintained for 6 months to assess the incidence of peri-implantitis. The clinical definition of peri-implantitis is based on following criteria: 1) presence of peri-implant signs of inflammation, 2) radiographic evidence of bone loss following initial healing, and 3) increasing probing depth as compared to probing depth values collected after placement of the prosthetic reconstruction. All the results were recorded in Microsoft excel sheet and was subjected to statistical analysis using SPSS software.

RESULTS

A total of 100 patients were analyzed. Mean age of the patients was 28.3 years. 65 percent of the patients were males while the remaining were females. Peri-implantitis was found to be present in 8 percent of the patients. Out of 8 patients with peri-implantitis, 5 were males while the remaining 3 were females. 3 patients were diabetic and 2 patients were found to be hypertensive.

Table 1: Incidence of peri-implantitis

Peri-implantitis	Number	Percentage
Present	8	8
Absent	92	92
Total	100	100

Table 2: Data of patients with peri-implantitis

Peri-implantitis	Number	Percentage
Mean age (years)	40.8	
Male	5	5
Female	3	3
Diabetic	3	3
Hypertensive	2	3

DISCUSSION

Peri-implant inflammations represent serious diseases after dental implant treatment, which affect both the surrounding hard and soft tissue. Due to prevalence rates up to 56%, peri-implantitis can lead to the loss of the implant without multilateral prevention and therapy concepts. Specific continuous check-ups with evaluation and elimination of risk factors (e.g.

smoking, systemic diseases and periodontitis) are effective precautions. In addition to aspects of osseointegration, type and structure of the implant surface are of importance. For the treatment of peri-implant disease various conservative and surgical approaches are available. Mucositis and moderate forms of peri-implantitis can obviously be treated effectively using conservative methods. These include the utilization of different manual ablations, laser-supported systems as well as photodynamic therapy, which may be extended by local or systemic antibiotics.⁴⁻⁶

Since there are several suggestions on the level of BL defining PI as such, differing amounts in the prevalence of peri-implant diseases have been documented. Calculations range from 19% to 65% for PM and from 1% to 47% for PI. To minimize scientific bias, previous authors recommended for incidence studies the threshold level of BL to be chosen at 1.0 to 1.5 mm. For prevalence studies a threshold level of BL of 2.0 mm is proposed, as baseline radiographs might be absent while the postimplant bone remodeling still needs to be included. Another aspect is a minimum time of 5 years after implant placement to judge on peri-implant diseases. Changes of bone level during that period might be exclusively based on physiological bone remodeling. Although various studies claim long-term follow-up of more than 5 years, the inconsistency becomes evident when focused on the mean follow-up, which might be limited.⁷⁻¹⁰

A total of 100 patients were analyzed. Mean age of the patients was 28.3 years. 65 percent of the patients were males while the remaining were females. Peri-implantitis was found to be present in 8 percent of the patients. Out of 8 patients with peri-implantitis, 5 were males while the remaining 3 were females. 3 patients were diabetic and 2 patients were found to be hypertensive. Weinstein T et al determined the prevalence of peri-implantitis and to assess its association with several patient- and implant-related factors. Patients with at least one implant, who came for a recall visit to one of the four centers over a period of five months, were enrolled. Presence of peri-implantitis (defined as bleeding on probing, exudate/suppuration, bone loss > 0.2 mm/year and increased pocket depth) and several other variables (e.g., smoking habits, history of periodontitis, diabetes) were recorded. Out of 248 enrolled patients (1162 implants), 10 patients had at least one implant with peri-implantitis (4.03%); a total of 14 implants were affected (1.20%). A statistically significant association between peri-implantitis and diabetes was found (OR 8.65; CI: 1.94–38.57). Smoking more than 10 cigarettes per day (OR: 0.53; CI: 0.03–9.45) and history of periodontitis (OR: 2.42; CI: 0.49–11.89) were not found to be statistically associated with peri-implantitis.¹⁰

It is most likely that peri-implantitis occurs following peri-implant mucositis, which is caused by plaque

accumulation around the implant. The inflammatory reaction of peri-implantitis has been observed to be more widespread than that of periodontitis in animal and human studies. Additionally, the composition of the inflammatory cells in peri-implantitis differs from that in periodontitis. In contrast with the chronic inflammatory features of periodontitis, peri-implantitis generally displays a more acute inflammatory status. However, some researchers have questioned whether dental plaque is the only etiologic factor in peri-implantitis.⁶⁻⁹ Astolfi V et al provided an overview of how risk factors can be related with peri-implantitis. A retrospective longitudinal study including 555 implants placed in 132 patients was evaluated based on the presence of peri-implantitis. In total, 21 patients (15.9%) suffered peri-implantitis (PPG) and 111 patients (84.1%) did not suffer peri-implantitis (NPG). The results reveal that smokers have a high incidence of peri-implantitis (72.7%) compared to non-smokers (27.3%) ($p < 0.0005$). Another variable with significant results ($p < 0.01$) was periodontitis: 50% PPG and 23.9% NPG suffered advanced periodontitis. Systemic diseases such as arterial hypertension, diabetes mellitus, osteoporosis, and cardiovascular diseases do not show a statistically significant influence on the incidence of peri-implantitis. Patients who did not attend their maintenance therapy appointment had an incidence of peri-implantitis of 61.4%, compared to 27.3% in those who attend ($p < 0.0001$).¹¹

CONCLUSION

Biological problems do occur with implant therapy, even if it is a comprehensive course of care. Recalls for strict supportive care may result in early diagnosis and decreased incidence of peri-implantitis.

REFERENCES

1. Javed F., Rahman I., Romanos G.E. Tobacco-product usage as a risk factor for dental implants. *Periodontology* 2000. 2019;81:48–56.
2. Lin C.Y., Chen Z., Pan W.L., Wang H.-L. The effect of supportive care in preventing peri-implant diseases and implant loss: A systematic review and meta-analysis. *Clin. Oral Implant. Res.* 2019;30:714–724.
3. Albrektsson T., Wennerberg A. Oral implant surfaces: Part 1—review focusing on topographic and chemical properties of different surfaces and in vivo responses to them. *Int. J. Prosthodont.* 2004;17:536–543.
4. Mombelli A., Lang N.P. The diagnosis and treatment of periimplantitis. *Periodontol.* 2000. 1998;17:63–76.
5. Karoussis I.K., Salvi G.E., Heitz-Mayfield L.J., Bragger U., Hammerle C.H., Lang N.P. Long term implant prognosis in patients with and without a history of chronic periodontitis: A 10-year prospective cohort study of the ITI dental implant system. *Clin. Oral Implant. Res.* 2003;14:329–339.
6. Monje A., Wang H.-L., Nart J. Association of preventive maintenance therapy compliance and peri-implant diseases: A cross-sectional study. *J. Periodontol.* 2017;88:1030–1041.
7. de Medeiros F., Kudo G.A.H., Leme B.G., Saraiva P.P., Verri F.R., Honório H.M. Dental implants in patients with osteoporosis: a systematic review with meta-analysis. *Int J Oral Maxillofac Surg.* 2018;47:480–491.
8. Dreyer H., Grischke J., Tiede C., Eberhard J., Schweitzer A., Toikkanen S.E. Epidemiology and risk factors of peri-implantitis: a systematic review. *J Periodontol Res Suppl.* 2018;53:657–681
9. Rocuzzo M., Layton D.M., Rocuzzo A., Heitz-Mayfield L.J. Clinical outcomes of peri-implantitis treatment and supportive care: A systematic review. *Clin. Oral Implants Res.* 2018;29(Suppl. 16):331–350.
10. Weinstein T, Clauser T, Del Fabbro M, et al. Prevalence of Peri-Implantitis: A Multi-Centered Cross-Sectional Study on 248 Patients. *Dent J (Basel).* 2020;8(3):80. Published 2020 Aug 3. doi:10.3390/dj8030080
11. Astolfi V, Ríos-Carrasco B, Gil-Mur FJ, et al. Incidence of Peri-Implantitis and Relationship with Different Conditions: A Retrospective Study. *Int J Environ Res Public Health.* 2022;19(7):4147.