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Peri-implantitis prevalence, incidence rate, and risk factors: A study of electronic health records at a U.S. dental school

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Abstract

Objectives: We assessed peri-implantitis prevalence, incidence rate, and associated risk factors by analyzing electronic oral health records (EHRs) in an educational institution.

Methods: We used a validated reference cohort comprising all patients receiving dental implants over a 3.5-year period (2,127 patients and 6,129 implants). Electronic oral health records of a random 10% subset were examined for an additional follow-up of ≥ 2.5 years to assess the presence of radiographic bone loss, defined as >2 mm longitudinal increase in the distance between the implant shoulder and the supporting peri-implant bone level (PBL) between time of placement and follow-up. "Intact" implants had no or ≤ 2 mm PBL increase from baseline. Electronic oral health record notes were reviewed to corroborate a definitive peri-implantitis diagnosis at implants with progressive bone loss. A nested case-control analysis of peri-implantitis-affected implants randomly matched by age with "intact" implants from peri-implantitis-free individuals identified putative risk factors.

Results: The prevalence of peri-implantitis over an average follow-up of 2 years was 34% on the patient level and 21% on the implant level. Corresponding incidence rates were 0.16 and 0.10 per patient-year and implant-year, respectively. Multiple conditional logistic regression identified ill-fitting fixed prosthesis (OR = 5.9; 95% CI: 1.6-21.1), cement-retained prosthesis (OR = 4.5; 2.1-9.5), and radiographic evidence of periodontitis (OR = 3.6; 1.7-7.6) as statistically associated with peri-implantitis. Implant location in the mandible (OR = 0.02; 0.003-0.2) and use of antibiotics in conjunction with implant surgery (OR = 0.19; 0.05-0.7) emerged as protective exposures.

Conclusions: Approximately 1/3 of the patients and 1/5 of all implants experienced peri-implantitis. Ill-fitting/ill-designed fixed and cement-retained restorations, and history of periodontitis emerged as the principal risk factors for peri-implantitis.

Keywords: epidemiology; periodontology; soft tissue-implant interactions.

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