IMPLANTS

Peri-implantitis

BACKGROUND

Dental implants are widely used to replace teeth in persons who are missing some or all of their dentition. Use of implants is expected to expand significantly over the coming years, based on current trends. A common complication of dental implant therapy is the development of peri-implantitis, a destructive inflammatory process that targets osseointegrated implants and leads to pocket formation and loss of bony support. Clinically, peri-implantitis is characterized by deep probing depths, usually more than 5 mm, along with bleeding on probing and suppuration. The prevalence of peri-implantitis varies in the literature, ranging from 4% to 45%. This variation is believed to result more from differences in the definition of peri-implantitis than from actually different prevalence in different areas. Factors associated with peri-implantitis have been identified, with a wide range of possibilities noted. A review of electronic health records (EHRs) of patients who have received implants was undertaken to determine the prevalence and risk factors for peri-implantitis in a clinical care setting at a US dental school.

METHODS

The 2127 patients whose records were studied had received 6129 implants over a period of 3.5 years. A random subset of 236 patients (633 implants) was the focus of a detailed investigation that extended an additional 2.5 years after implant placement. Among the specific data sought were presence of radiographic bone loss, which was defined as a longitudinal increase of more than 2 mm in the distance from the implant shoulder to the supporting peri-implant bone level (PBL) between time of placement and follow-up. When no PBL increase or an increase less than 2 mm was identified, the case was defined as 'intact.' A case-control analysis of implants with peri-implantitis and intact implants in randomly matched by age persons was done to identify risk factors.

RESULTS

EHR analysis of a validated cohort of 215 patients (540 implants) found 73 patients with 114 implants with peri-implantitis and 151 intact implants, as well as 142 patients (275 implants) with no evidence of peri-implantitis. The prevalence was 34% on a patient level and 21% on the individual implant level.

When incidence rate was analyzed, it was found that the incidence at the patient level was 0.16 per patient-year. On the implant level, the incidence rate was 0.10 per implant-year.

Factors related to the development or absence of peri-implantitis were gleaned from a comprehensive review of 5244 records. Age was the only variable statistically significantly different between patients with and without peri-implantitis. Patients with peri-implantitis were older than those without it (61.2 years versus 56.9 years).

An implant-level comparison between those implants with and without peri-implantitis showed average follow-up time was 754 days for the intact group and 960 days until diagnosis with peri-implantitis for the peri-implantitis–affected group. Longitudinal PBL in peri-implantitis–affected implants was 3.1 mm at the mesial and 3.5 mm at the distal implant surfaces. For intact implants these were 0.2 mm and 0.6 mm, respectively. Average longitudinal bone loss was 22.5% at the mesial and 24.6% at the distal surfaces of peri-implantitis–affected implants, but 2.0% and 2.7%, respectively, in the intact group. No statistically significant differences between the 2 groups were noted in implant dimension, implant manufacturer, location in the jaw, surgeon affiliation, antibiotic prescription connected to the surgery, implant placement immediately after tooth extraction, implant placement in native bone, use of bone grafting material connected to the surgery, or restoration with a fixed or removable prosthesis.

Factors that differed between the 2 groups included significantly more screw-retained prostheses in intact versus peri-implantitis–affected implants. In addition, cemented prostheses and ill-fitting/poorly designed prostheses were significantly more common among peri-implantitis–affected implants compared to intact implants. Factors found to be significantly protective against peri-implantitis were female gender, prescription of antibiotics at any point connected with the surgery, multi-unit fixed prosthesis, Straumann dental implants, and implant located in the mandible or posterior regions. The significant risk factors for developing peri-implantitis were cement-retained prosthesis, ill-fitting/poorly designed fixed prosthesis, and history or radiographic evidence of periodontitis.

DISCUSSION

The use of EHRs allows very precise estimates of the cumulative prevalence and incidence rate of peri-implantitis. In addition, risk factors for the development of peri-implantitis were readily found. A high prevalence of peri-implantitis was found in these patients, and both an important comorbid condition and 2 iatrogenic exposures were identified.

Clinical Significance

Patients who receive implants should be made aware of the factors associated with the development of the complication of peri-implantitis. Problems with periodontitis, having ill-fitting and ill-designed prostheses, and the placement of cemented rather than screw-retained prostheses are all issues that should be addressed before implant placement. Avoiding such problems should reduce the risk for developing peri-implantitis.

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Antibiotic prophylaxis

BACKGROUND

The routine prescription of prophylactic antibiotics for the surgical placement of dental implants remains a controversial area. Several reviews and meta-analyses have found antibiotic prophylaxis to be a good practice and recommend various regimens. Several other systematic reviews and analyses have concluded there is no benefit to the use of antibiotics given prophylactically for patients at low to moderate risk for infection who are receiving implants. Instead they recommend monitoring antibiotic use among dental practitioners. All of the publications have focused on preventing dental failure instead of preventing postoperative infections (POIs). None have addressed the major risks associated with antibiotic use. These risks include drug-related adverse events that can range from mild to lethal, with examples such as hypersensitivity allergic and serum reactions, direct organ toxicities, and superinfections. Dental implant surgery can involve POIs. The conflicting recommendations regarding antibiotic prophylaxis to avoid POI development require more complete evaluation focused on the most current literature. The efficacy of antibiotic prophylaxis and specific antibiotic regimens in dental implant surgery to prevent POI was investigated.

METHODS

The PubMed, CINAHL, Embase, and Dentistry & Oral Sciences Source (DOSS) electronic databases were searched up to July 14, 2017, In addition, the US National Institutes of Health Clinical Trials Database was searched for ongoing studies, bibliographies of previous reviews were evaluated, and a hand search of relevant studies published in dental journals from 2000 to 2017 was also performed. Ten randomized controlled trials (RCTs) covering 1934 patients were identified and analyzed. In addition to POI prevention, secondary analyses included wound dehiscence, pain, and adverse events.

RESULTS

Primary Outcome

The primary infection outcome was not statistically significantly different in all 10 trials.

The meta-analysis found no statistically significant difference in total POI and early and late POI regardless of whether antibiotics were given or in relation to specific antibiotic dosing groups versus comparative antibiotic regimens. The no antibiotic/placebo group and all antibiotic regimens groups showed no significant difference in POI. The various regimens included preoperative only administration, pre- and postoperative antibiotic administration, and pre- and postoperative or postoperative only antibiotic use. Dosing schedule comparisons also found no statistically significant difference in POIs.

POIs were investigated as those occurring overall, those developing within 1 to 2 weeks of surgery (early POI), and those delayed until 3 to 4 months after surgery (late POI). No difference in POI was found for early or late infections or for the various treatment groups (no antibiotic/placebo groups, all antibiotics, preoperative only groups, pre- and postoperative antibiotic groups, or pre- and postoperative/postoperative only antibiotic groups).

Secondary Outcomes

Secondary outcomes also showed no significant differences except for 1 for wound dehiscence and 2 for pain. When the