



Effects of Smoking on Periimplant Health Status and IL-1 β , TNF- α , and PGE₂ Levels in Periimplant Crevicular Fluid: A Cross-Sectional Study on Well-Maintained Implant Recall Patients

Ufuk Tatlı, DDS, PhD,* İbrahim Damlar, DDS, PhD,† Özgür Erdoğan, DDS, PhD,‡ and Emin Esen, DDS, PhD§

Implant therapy is a growing dental treatment method in partially or totally edentulous patients. Although plaque-induced inflammation and occlusal loading are considered as the most important factors influencing the prognosis of oral implant treatment, smoking is reported as a significant determinant related to the periimplant tissue changes and implant failure.^{1,2} Currently, there are an estimated 1.3 billion smokers worldwide,³ and smoker candidates for dental implant treatment are growing day by day. Thus, certain aspects concerning current dental implant therapy should be considered for smokers in treatment planning, oral surgical procedures, and the maintenance phases of dental implant treatment.

The initiation and early development of an inflammatory reaction in periodontal

Purpose: The aim of this cross-sectional study was to evaluate the effects of smoking on periimplant health status and inflammatory cytokines interleukin-1 β , tumor necrosis factor- α , and prostaglandin E₂ levels in periimplant crevicular fluid (PICF) and to determine their correlation with clinical parameters in well-maintained implant recall patients.

Material and Methods: A total of 60 dental implants placed in 60 patients (27 patients were smoker and 33 were nonsmoker) were included in the study. Plaque index, gingival index, probing depth, periimplant bone loss, PICF volume, and biochemical cytokine levels in PICF were determined and analyzed statistically. The correlation between

PICF cytokine levels and clinical parameters were also analyzed.

Results: All clinical parameters with the exception of plaque scores were significantly higher in the smoker group. Significantly increased levels of cytokines were observed in the smoker group. The correlation between the cytokine levels and clinical parameters were more marked in smokers.

Conclusions: Although the implants of the smoker patients seem to be clinically healthy, the results demonstrate that the implants are relatively at risk even if in a well-maintained population. (Implant Dent 2013;22:519–524)

Key Words: dental implant, inflammatory cytokine, smoking, periimplant crevicular fluid

*Clinical Instructor, Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Çukurova University, Adana, Turkey.

†Assistant Professor, Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Mustafa Kemal University, Hatay, Turkey.

‡Associate Professor, Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Çukurova University, Adana, Turkey.

§Professor, Private Practice in Oral and Maxillofacial Surgery, Adana, Turkey.

Reprint requests and correspondence to: Ufuk Tatlı, DDS, PhD, Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Çukurova University, Çukurova Üniversitesi Dis Hekimliği Fakültesi, Ağız Dis ve Cene Cerrahisi Anabilim Dalı, 01330 Sarıcam-Balcılı, Adana, Turkey, Phone: +90 322 338 6354, Fax: +90 322 338 7331, E-mail: dr.ufuktatli@gmail.com

tissues can be induced by bacterial metabolites such as lipopolysaccharides or by host cells that release several types of cytokines that can activate degradative pathways.⁴ Previous studies have indicated that the tissue damage is caused more by the host response rather than from direct bacterial action.⁵ Recent studies showed that, in periimplant tissues, inflammatory cytokines have an important role in regulating and amplifying the inflammatory response.⁶ The

inflammatory cytokines are used as biochemical markers of periodontal and periimplant destruction because of their conspicuously high crevicular concentrations in diseased periodontal and periimplant sites.^{5,6} Interleukin(IL)-1 β , tumor necrosis factor (TNF)- α , and prostaglandin (PG) E₂ are among the well-known and important inflammatory cytokines in the oral cavity.

In response to a periodontal or periimplant inflammation, IL-1 β is