

Decontamination of dental implant surfaces by means of photodynamic therapy

Juliana Marotti & Pedro Tortamano & Silvana Cai & Martha Simões Ribeiro & João Eduardo Miranda Franco & Tomie Toyota de Campos

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Abstract Several implant surface debridement methods have been reported for the treatment of peri-implantitis, however, some of them can damage the implant surface or promote bacterial resistance. Photodynamic therapy (PDT) is a new treatment option for peri-implantitis. The aim of this *in vitro* study was to analyze implant surface decontamination by means of PDT. Sixty implants were equally distributed (n=10) into four groups and two subgroups. In group G1 there was no decontamination, while in G2 decontamination was performed with chlorhexidine. G3 (PDT-laser+dye) and G4 (laser, without dye) were divided into two subgroups each; with PDT performed for 3 min in G3a and G4a, and for 5 min in G3b and G4b. After 5 min in contact with methylene blue dye (G3), the implants were irradiated (G3 and G4) with a low-level laser (GaAlAs, 660 nm, 30 mW) for 3 or 5 min (7.2 and 12 J). After the dilutions, culture media were kept in an anaerobic atmosphere for 1 week, and then colony forming units were counted. There was a significant difference ($p < 0.001$) between G1 and the other groups, and between G4 in

comparison with G2 and G3. Better decontamination was obtained in G2 and G3, with no statistically significant difference between them. The results of this study suggest that photodynamic therapy can be considered an efficient method for reducing bacteria on implant surfaces, whereas laser irradiation without dye was less efficient than PDT.

J. Marotti
Department of Prosthodontics and Dental Materials,
Medical Faculty, University Hospital RWTH Aachen,
Pauwelsstrasse 30,
52074 Aachen, Germany

P. Tortamano · J. E. M. Franco · T. T. de Campos
Department of Prosthodontics,
School of Dentistry,
University of São Paulo,
Av. Prof. Lineu Prestes, 2227,
05508-000 São Paulo, SP, Brazil

P. Tortamano
e-mail: tortamano@usp.br

J. E. M. Franco
e-mail: joaofranco@usp.br

T. T. de Campos
e-mail: tncampos@usp.br