

## **COMPARISON OF DIFFERENT CHEMICAL AND MECHANICAL DECONTAMINATION MODALITIES ON TITANIUM DENTAL IMPLANTS: A IN VITRO MODEL OF A PERI-IMPLANTITIS DEFECT.**

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### **Introduction:**

Resolution of peri-implantitis lesions can occur following implant surface decontamination. However complete plaque removal with mechanical devices is jeopardized by limited access to the implant surface.

### **Aims:**

The aim of this in vitro study was to evaluate the efficacy of chemical and mechanical methods used for decontamination of titanium dental implants previously infected with polymicrobial biofilms in a model simulating a peri-implant defect.

### **Methods:**

Polymicrobial biofilms were grown on 25 titanium implants with SLA surface. The experimental groups were divided into 5 different disinfection modalities as follows: (i) no treatment (C), (ii) air polishing device without any powder (AW), (iii) air polishing device with erythritol powder (AE), (iv) use of sulfonic/sulfuric acid solution in gel (H), and (v) the combination of H and AE. Group C and AW were used as negative and positive control. Before treatment implants were kept into a model simulating a peri-implant bony defect (10mm wide; 5mm deep) by mean of a metal structure. The decontamination effect of each modality was evaluated by microbial culture analysis in aerobic and anaerobic conditions. Kruskal-Wallis and pairwise comparisons were used to compare differences between colony-forming units per millilitre [ $\log_{10}(\text{CFU/ml})$ ] values and treatments modalities ( $P < 0.05$ ).

### **Results:**

This study demonstrated that the use of H and the combination of H and AE were superior to C in reducing bacterial counts [ $3.75 \log_{10}(\text{CFU/ml})$  and  $3.91 \log_{10}(\text{CFU/ml})$  respectively vs.  $7.48 \log_{10}(\text{CFU/ml})$ ]. H performed better than AW [ $7.48 \log_{10}(\text{CFU/ml})$ ]. A significant decontaminant effect on the implant surface despite the limited accessibility due to the model simulating the peri-implant defect was achieved using the sulfonic/sulfuric acid solution in gel. No differences were shown between the groups receiving other treatments.

### **Conclusions:**

The use of chemical decontamination reduces more the bacterial load on previously infected implants compared to other treatment modalities.