

OZONIZED-OIL, POVIDONE-IODINE, CHLORHEXIDINE-DIGLUCONATE AGAINST ORAL-BIOFILM ON MICROSTRUCTURED-TITANIUM SURFACE

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Implant surface decontamination is a crucial aspect for peri-implantitis treatment.

The purpose of this preclinical-study was to compare the efficacy of 100% ozonated-oil (O3-OIL) to 0.2% chlorhexidine-digluconate (CHX) and 10% povidone-iodine (PVP-I) against an oral-biofilm developed on a microstructured-titanium surface.

Four overly-healthy adults with good oral-hygiene and good oral-health were enrolled. Oral-biofilm was formed in-situ on 144 sandblasted titanium specimens (Ra: 1.68). Specimens were fixed on custom-made splints and exposed into the oral cavity overnight (12h). Biofilm-covered specimens were then randomly assigned to four groups: O3-OIL(n=36), CHX(n=36), PVP-I(n=36) and phosphate-buffered-saline (PBS)(n=36) as negative-control. Specimens were tested for a 1min of incubation-time. Viable biofilm was then quantified by bioluminescence on microtiter-plates.

A linear mixed effects model was used to evaluate the influence of the type of antiseptic on the effectiveness, considering as fixed effects the antiseptic and the experiment. The distributive normality of the bioluminescence was evaluated with the Shapiro-Wilk test. The Mann-Whitney U-test was performed for the comparison among the antiseptics. The α significance level was set at 0.05; for the multiple comparisons was applied the Bonferroni correction ($\alpha=1.7e-2$).

Each antiseptic was able to significantly reduce ($p<0,001$) the oral-biofilm when compared to the negative-control. The comparison among the tested antiseptics reveals that O3-OIL was less effective than both PVP-I ($p<0,001$) and CHX ($p<0,001$) against the oral-biofilm. PVP-I and CHX showed to be equally effective against the oral-biofilm since the difference between them was not significant ($p=0,386$).

The present work contrast with previous promising findings, where O3-OIL resulted as effective as or superior to CHX and PVP-I against planktonic microorganisms. Biofilm seems to be a significant limit to O3-OIL effectiveness.