

Chlorhexidine-Delivery-System Based on Acrylic Resins - Microbiological and Biocompatibility Studies

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Resumo:

Objectives: Evaluate the antimicrobial activity against *Candida albicans* and *Streptococcus oralis* and to assess the cytotoxic potential, using cultures of fibroblasts, of acrylic relined resins loaded with chlorhexidine.

Methods: Three acrylic relined resins were loaded with a chosen concentration of chlorhexidine: Kooliner was incorporated with 2.5% (w/w) while Ufi Gel Hard and Probase Cold were loaded with 5% (w/w). All materials also included a control group (0% chlorhexidine). Two distinct microbiological tests were carried out: agar diffusion and antibiofilm assay. For the agar diffusion assay, resin disks were placed on agar plates inoculated with *Candida albicans* (ACTT 10231) and *Streptococcus oralis* (ATCC 3507), separately, and after 48 hours at 37°C, the diameters of inhibition zones were measured. To determine the antibiofilm activity, resin discs were placed in inoculated medium with *Candida albicans* and incubated for 48 hours at 37°C. Specimens with biofilm on the surface were fixed with different ethanol solutions, analyzed and photographed using a scanning electron microscope. To assess the cytotoxic potential, extracts were obtained by incubating the specimens in 1 mL of distilled water for 24 hours at 37°C. Afterwards, cultures of L929 fibroblasts (ATCC1 CCL-1TM) were exposed to the extracts and cell viability was determined by the spectrophotometric tetrazolium bromide reduction assay. Negative and positive control groups were used. Data were analyzed using parametric t-test ($p=0.05$).

Results: All resins loaded with chlorhexidine showed an inhibition halo in both strains. However, only Probase Cold with 5% chlorhexidine showed antibiofilm activity, no microorganism was observed on the surface of the material whereas all the other tested groups demonstrated the existence of a biofilm layer of *Candida albicans*. The incorporation of the drug decreased cell viability in the three tested resins (p