Evaluation of bacterial adhesion after Chlorexidine incorporation in the Ti7.5Mo alloy surface for drug release

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Resumo:
Bacterial adhesion to implant surface is an important event in the pathogenesis of bacterial infections. Implant related infections are a serious complication in prosthetic surgery, substantially damaging implant fixation. Antibacterial surface treatments have been proposed to decrease this. In this study, the susceptibility and efficacy of the chlorhexidine incorporation on the Ti7.5Mo alloy surface after biomimetic treatment was evaluated. For alkaline surface treatment was carried out according our previous studies. Briefly, samples were immersed in a 5.0 M NaOH aqueous solution at 80 °C for 3 days, washed with distilled water, and dried at 40 °C for 24 h. After alkaline treatment, samples were heat-treated at 450 °C for 1 hour in an electric furnace. After the samples were immersed in a 2% chlorhexidine for 30 minutes, after remove the excess and stored. The morphology of the surface was evaluated by using a scanning electron microscope. The wettability of the surfaces was evaluated by contact angle analysis using the sessile drop method. The antibacterial effects were evaluated by inoculating S. Epidermidis on the Ti7.5Mo alloy with and without 2% Chlorhexidine. Biofilms were grown in acrylic discs immersed in sterile brain heart infusion broth (BHI) containing 5% sucrose, inoculated with microbial suspension and incubated for 24 hours. Then the numbers CFU/ml (log10) were counted and analyzed statistically. Results showed that bacterial adhesion was influenced by chlorhexidine incorporation associated biomimetic treatment. Surface treatment showed excellent antibacterial properties against S.Epidermidis. Our finding showed that surface treatment exhibited antibacterial efficacy with repeatability.