

Comparison of disinfectant solutions effect on speed of Cobalt – Chromium Alloy corrosion

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Abstract

Background and Aim: Corrosion may be a consequence of disinfecting and cleansing of partial denture chromium – cobalt frameworks using chemical disinfectants and cleansers. There is short information in literature about the effect of these solutions, in comparison with each other, on the corrosion rate of chromium – cobalt alloy. The present study was designed to compare corrosion rate of the chromium – cobalt alloy in disinfecting solutions.

Materials and Methods: In this experimental in-vitro study, corrosion rates of 35 chromium-cobalt immersed in 7 disinfecting solutions were determined. As a complementary test, samples were immersed in two groups of solutions which showed the least and the most corrosion rates as measured by electrochemical tests for a period of one week and their surface and also surface of one untreated control sample was photographed under a scanning electron microscope. Corrosion rates obtained, were statistically analyzed using variance analysing test and multiple comparisons were made using Tukey HSD and Dunnett tests.

Result: The corrosion rates of chromium cobalt sample in the studied solutions from the highest to lowest, were: Sodium Hypochlorite 1%, Fittydent 1 tab/250ml, Micro 10+ 5%, Korsolex Plus 3%, Deconex 53 Plus 2%. Corrosion rates were statistically different in the studied solutions ($P < 0.05$). SEM photographs showed no evidence of corrosion on control sample and samples immersed in Decomex 53 Plus 2%, but localized corrosion was observed on samples immersed in Sodium Hypochlorite 1%.

Conclusion: The present study indicated that Sodium Hypochlorite at the concentration of 1% or more for the purpose of disinfection and cleansing of chromium-cobalt not be used.

Keywords: Corrosion, Chromium, Cobalt, Dental Disinfectant