Title: In vitro evaluation of mutagenicity and cytotoxicity of four root canal sealers
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Background and Aim: Root filling materials are usually in close contact with living tissues. So their biological properties like mutagenicity and cytotoxicity are important. These properties help us determine the potential damage to periapical tissues, or potential DNA mutations, and malignant transformation of the cells. The aim of this study was to evaluate the mutagenicity and cytotoxicity of four root canal sealers: AH Plus (Dentsply, DeTrey), Ketac-Endo Aplicap (3M ESPE), Sankin Apatite III (Sankin K.K), and Tubli-Seal EWT (Kerr).

Materials and Methods: In this experimental in vitro study fresh and set specimens from AH Plus, Ketac-Endo Aplicap, Sankin Apatite III, and Tubli-Seal EWT were immersed in culture medium for 1, 2 and 7 days. Cytotoxicity was assessed using tetrazolium bromide reduction assay (MTT) after 1, 2 and 7 days exposure of diluted extracts to L929 cells. Extracts of sealers in phosphate buffer saline (PBS) were used to examine the potential toxicity of Tubli-Seal showed no decrease with time. No mutagenicity by sos-umu test according to standard procedures. Data were analyzed using one way ANOVA, Kruskall Wallis, Mann Whitney and Post hoc tests with P<0.05 as the level of significance.

Results: Extracts of all freshly mixed sealers were cytotoxic. Ketac-Endo Aplicap and Sankin Apatite III showed the lowest toxicity respectively and Tubli-Seal EWT the highest. In contrast to other sealers, the cytotoxicity of Tubli-Seal showed no decrease with time. β-galactosidase did not increase significantly thus none of the sealers showed mutagenic effects.

Conclusion: Based on the results of this study, Tubli-Seal EWT showed the highest cytotoxicity with time. Other sealers showed decreasing cytotoxicity with time. No mutagenicity effects was observed in none of tested materials.

Key Words: Mutagenicity; Cytotoxicity; Root canal sealers