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Genotoxic effect of sodium fluoride on stem cells from human exfoliated deciduous teeth

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Introduction: Due to its unique properties, Fluoride has been widely used for the prevention and control of dental caries in dentistry. However, there is much controversy over its toxicity effects such as dental fluorosis, skeletal fluorosis, reproductive, renal, gastrointestinal, immunological, neurological, genotoxicity and carcinogenicity. As DNA damage is the primary step in the carcinogenesis process, so the aim of this study was to evaluate of fluoride genotoxicity on Stem cells from Human Exfoliated Deciduous teeth (SHED). Stem cells are the target of carcinogenesis.

Materials and Methods: SHED in culture medium were exposed directly to sodium fluoride (NaF) at concentrations of 10, 50, 100 PPM. We used methalmetasulfonate(MMS) at 1, 5, and 15 µg/ml as the positive control and the negative control was culture medium for mesenchymal stem cells. The comet assay was carried out for detecting DNA damage. Damaged cells are comet-like under fluorescence microscopy. Comet analysis was accomplished using computerized image analysis software (CASP). Four parameters containing %Tail DNA (%TD), Tail Length(TL), Tail Moment (TM) and Olive Tail Moment(OTM) were evaluated. Data were analyzed with SPSS version 15.

Results: Kruskal-Wallis test show that the mean of four parameters was significantly in all the groups ($p < 0.05$).

Conclusion: NaF at different concentrations was able to induce DNA damage in SHED.

Biography

Sahar Talebi graduated in dentistry. She is working as a dentist and clinician, her field of interest is tooth development and dental stem cell. She is experienced in isolation, culture and preservation of stem cell from human exfoliated deciduous teeth (SHED)

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