

CYTOTOXICITY OF GLASS IONOMER CEMENT ON HUMAN EXFOLIATED DECIDUOUS TEETH STEM CELLS CORRELATES WITH RELEASED FLUORIDE, STRONTIUM AND ALUMINUM ION CONCENTRATIONS

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Abstract: Stem cells from human exfoliated deciduous teeth (SHED) can be used as a cell-based therapy in regenerative medicine and in immunomodulation. Pulp from human deciduous teeth can be stored as a source of SHED. Glass ionomer cements (GICs) are commonly used in restorative dentistry and in cavity lining. GICs have lower biocompatibility and are cytotoxic for dental pulp cells. In this study, seven commonly used GICs were tested for their cytotoxic effects on SHED, for their potential to arrest mitosis in cells and induce chromosome aberrations, and were compared with the effects of composite. Fuji II, Fuji VIII, Fuji IX, Fuji plus and Vitrebond had significantly higher cytotoxic effects on SHED than composite. Only SHEDs that have been treated with Fuji I, Fuji IX, Fuji plus and composite recovered the potential for proliferation, but no chromosome aberrations were found after treatment with GICs. The cytotoxic effects of GICs on SHEDs were in strong correlation with combined concentrations of released fluoride, aluminum and strontium ions. Fuji I exhibited the lowest activity towards SHEDs; it did not interrupt mitosis and did not induce chromosome aberrations, and was accompanied by the lowest levels of released F, Al and Sr ions.

Key words: Glass ionomer cements; cytotoxicity; fluoride; aluminum; strontium; SHED.

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