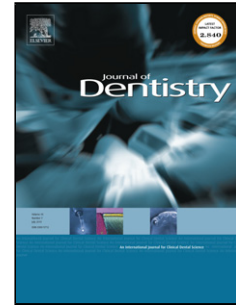


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***In-vitro* apatite formation capacity of a bioactive glass – containing toothpaste**

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Abstract

Objectives: The *in-vitro* dissolution of bioactive glass-based toothpastes and their capacity to form apatite-like phases in buffer solutions have been investigated.

Materials and Methods: The commercial toothpaste samples were tested on immersion in artificial saliva, Earle's solution and Tris buffer for duration from 10 minutes to four days. The powder samples collected at the end of the immersion were studied using solid-state ³¹P and ¹⁹F nuclear magnetic resonance spectroscopy (NMR), X-ray powder diffraction and Fourier transform infrared (FTIR) spectroscopy. The fluoride concentration in the solution remained after the immersion was measured.

Results: In artificial saliva and in presence of sodium monofluorophosphate (MFP), the bioactive glass and bioactive glass-based toothpastes formed fluoridated apatite-like phases in under 10min. A small amount of apatite-like phase was detected by ³¹P NMR in the toothpaste with MFP but no bioactive glass. The toothpaste with bioactive glass but no fluoride formed an apatite-like phase as rapidly as the paste containing bioactive glass and fluoride. By contrast, apatite-like phase formation was much slower in Earle's solution than artificial saliva and slower than Tris buffer.

Conclusions: The results of this lab-based study showed that the toothpaste with MFP and bioactive glass formed a fluoridated apatite in artificial saliva and in Tris buffer, as did the mixture of bioactive glass and MFP.

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