COMPARISON OF MILK AND DESENSITIZING DENTIFRICES IN REDUCING HYDRAULIC CONDUCTANCE OF HUMAN DENTIN *IN VITRO*

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Abstract. Dentin hypersensitivity is a common condition usually associated with exposed dentinal surfaces which can become a problem especially in elderly people. Hydraulic conductance of dentin has been used to evaluate the sensitivity of dentinal tubules. The aim of this study was to compare the effects of cow's milk, two desensitizing dentifrices and 3% potassium tetraoxalate (positive control) in reducing the hydraulic conductance of human dentin in extracted teeth. We transversely sectioned 28 non-carious extracted human premolars 2 mm below the cemento-enamel junction. We exposed the dentin at the tip of the buccal cusp by cutting a cavity (3 mm diameter, 3 mm deep), and examined the hydraulic conductance of the dentin using the fluid filtration device under 100 mm Hg hydrostatic pressure. We removed the smear layer before each test using 37% phosphoric acid for 30 seconds. Each tooth was examined after being treated with the tested substance. Each substance was examined for each tooth. The substances examined were: cow's milk, Colgate Sensitive Pro-relief™, Sensodyne® Rapid Relief, and 3% potassium tetraoxalate. The dentinal tubules were also examined with a scanning electron microscope. Milk, Colgate Sensitive Pro-relief™, Sensodyne® Rapid Relief, and 3% potassium tetraoxalate significantly reduced hydraulic conductance by 15.0%, 18.6%, 17.5%, and 72.6%, respectively, from their baseline values ($p<0.05$, paired *t*-test). No significant differences were seen between cow's milk and Colgate Sensitive Pro-relief™ and Sensodyne® Rapid Relief ($p>0.05$). Cow's milk reduced hydraulic conductance to a similar degree to the selected desensitizing dentifrices. Cow's milk may be an alternative choice to treat patients suffering from dentin hypersensitivity.

Keywords: dentin permeability, dentin sensitivity, desensitizing dentifrices, human dentin, hydraulic conductance, milk

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