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MEETING ABSTRACT

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Evaluation of fluoride concentration in tapped, bottled and filtered water available in Croatia

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Background: Fluoride is a chemical element that has been shown to cause significant effects on human health through drinking water. International standards for drinking water have been established by organizations such as the World Health Organization (WHO). However, local conditions as well as diet and exercise play a large role in body fluoride intake during the day. Fluoride administered in optimal concentration is caries-protecting, while excessive amounts of fluoride can cause dental fluorosis, skeletal fluorosis and osteoporosis. To adjust the right amount of fluoride to patient, one needs to know the daily intake of fluoride through drinking water since it is the main source of fluoride for the human body. The aim of this study was to determine fluoride concentrations in waters most frequently used domestically, which are tapped, bottled and filtered water.

Methods: Samples of tapped waters were obtained from different homes that were supplied from all five main water wells of Zagreb, Croatia. Samples of filtered water were taken after running through two main types of water filtration systems: silver-impregnated activated carbon and ion-exchange filters and filters based on reverse osmosis and ultrafiltration. Samples of bottled water were acquired from three supermarkets, all of eight commercially available brands in Zagreb. All samples were tested with a combination fluoride-ion-selective electrode (Orion, 96-09-00, MA, USA) and the average read-out of two tests was recorded.

Results: The mean fluoride content of the tapped water samples was 0.032 mg F/l with a range from 0.027 to 0.037 mg F/l. The mean fluoride content of filtered water samples was 0.022 mg F/l with a range from 0.003 to 0.037 mg F/l. The mean fluoride content of the bottled water samples was 0.083 mg F/l with a range from 0.015 to 0.301 mg F/l.

Discussion: Caries prevention is done on an individual basis. In the context of a prevention program it is important to investigate the source of drinking water. Individuals using water filtered with filters based on reverse osmosis and ultrafiltration as main source of drinking water should receive a more intense caries prevention program.

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