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Influence of the Saliva Secretion Kinetics on the Fluoride Bioavailability

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Objectives: Individual saliva secretion plays a crucial role in enamel and dentin remineralization. The amount of secreted saliva influences the bioavailability of the topically applied fluoride. The aim of our investigation was to compare the individual saliva secretion with the fluoride amount after using 2 different tooth brushing products ELMEX® and DENTTABS®. **Methods**: To assess oral fluoride kinetics four highly trained volunteers (3 fast saliva secretors, 1 slow saliva secretor) brushed there teeth with one of the products and the saliva was collected. The amount of collected saliva was measured, and the fluoride content was analysed using a fluoride sensitive electrode. All 4 subjects repeated all study cycles 5 times, and 3 cycles per subject underwent statistical analysis using Mann-Whitney-U test and Spearman correlation. The ex-vivo component included the individual saliva collection of the same volunteers, the hygienic products were solved in equal amounts of whole saliva, and the fluoride content was repeatedly measured in 5 cycles. **Results**: Slow secretor exhibited an increase in saliva secretion after using both oral hygiene products (0.2 ml/min vs.1.6 ml/min after brushing) and fast secretors did not. In-vivo results of fluoride content after 3 min. tooth brushing demonstrated a clear correlation to saliva secretion ($p<0.002$).The ex-vivo fluoride content for DENTTABS® was 255.6 ±14.8 ppm and for ELMEX® was 175.8 ±8.6 ppm. Correlating individual in-vivo and ex-vivo data it was shown that fast secretors expectorate ca. 73 % of fluoride content immediately after brushing, vs. slow secretor expectorated ca. 97%. **Conclusions**: The fluoride bioavailability of saliva after exposure to DENTTABS® was higher compared to ELMEX®. The individual secretion rate changes the fluoride content and normal secretors keep the fluoride availability longer.