

0011 Effect of a Progressive Hydrogel-Incorporated Sugar on Oral Clearance. A. Lehrkinder, a. alshabeeb, P. Lingström

Cariology, Odontology, Gothenburg, Type a choice below ..., Sweden

Objectives A novel carbohydrate-ingestion technology that uses a hydrogel network to encapsulate monosaccharides within biopolymer matrix provides high-sugar intake whilst minimizing their impact on oral health. This study investigated the effectiveness of oral sugar clearance after consuming sugar-concentrated drinks with different degrees of sugar encapsulation compared with the control solution. Additionally, the research explored whether the encapsulation of carbohydrates influences the perception of sweetness of those products.

Methods Twelve participants tested three products with identical sugar concentration (60% glucose + fructose): Gel 100 (Maurten, Gothenburg, Sweden), alginate beads (Maurten, non-commercial product) and control solution during three sessions. Interproximal and whole saliva were collected before and after rinsing up to 45 min. The saliva was collected using paper points at three sites: maxillary front, maxillary premolar/molar and mandibular canine/premolar. Participants graded the sweetness experience of the products on a VAS scale. Sugar concentrations in saliva samples were analyzed using dinitrosalicylic acid (DNS) method. Two-way ANOVA with Šídák multiple comparisons test was used to compare differences between areas under the curve (AUC) with p<0.05 statistically significant.

Results Beads showed the lowest sugar concentration in whole and interproximal saliva compared with Gel 100 and the control. Beads also had significantly lower AUC, indicating an effective elimination from the oral cavity thus, a rapid oral clearance rate (p<0.01). A significant difference (p<0.05) was observed between Gel 100 and control for mean AUC for the three sites. The highest sugar concentration was found in the premolar/molar region, followed by mandibular canine/premolar region and lowest in the maxillary front. The sugar encapsulation affects the sweetness experience of the test products, where beads were graded as the least sweet of all three products tested. **Conclusions** A higher degree of carbohydrate encapsulation (beads) resulted in more effective oral clearance, thus preventing damaging exposure of the oral cavity to high concentrations of sugars.