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Objectives: Severe hypoglycemia is the most common acute complication of type 1 diabetes (T1D), and urgent treatment is required. When glucagon is not available, administration of glucose gel or bee honey inside the cheek is advised in guidelines. Still, there is a lack of evidence whether glucose is absorbed through the oral mucosa. The objective of this study was to explore if application of bee honey on the oral mucosa outside the row of teeth without swallowing the honey would increase the blood glucose in children with T1D.

Methods: Ten children (5 boys, 5 girls); age 8.8-12.9 years, T1D 3-10 yrs participated. All were using CSII and CGM. HbA1c 41-53 mmol/mol, insulin doses last 14 days 0.48 - 1.12 U/kg/d. Bee honey containing 0.3 g carbohydrates/kg bodyweight was applied to the vestibular oral mucosa. As control, all children applied a similar quantity of coconut oil supplemented with artificial sweetener on a separate visit. Blood and tissue glucose were registered 10 minutes before, just before and 5, 10 and 15 minutes after application. To avoid swallowing, the children had a saliva extractor inside their mouth. The Regional Ethics Committee approved the study, and children and parents consented to participate.

Results: The amount of honey applied was 11-21 g (mean 14.3 g), containing 9-17 g (mean 11.5 g) carbohydrates. All children used the saliva extractor, and no one reported swallowing the bee honey/coconut oil. None of the children experienced a clinically significant increase in blood or tissue glucose level after either application of bee honey or coconut oil (figure 1). CGM trend arrows predicted stable glucose level in 9 of 10 children ten minutes before application and in 8 of 10 children 15 minutes after application of bee honey.

Conclusions: Bee honey application should not be recommended as treatment of severe hypoglycemia in T1D.