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The Effect Of Prebiotics In Newly Diagnosed Youth With Type 1 Diabetes (T1D)

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Acetylated and butyrylated high amylose starch (HAMS-AB) is a prebiotic that is effective in T1D prevention in mouse models. It alters the gut microbiome profile towards bacterial fermenters with increases short chain fatty acids (SCFA) production which improves glycemia, insulin sensitivity and secretion. The objective of this pilot study is to assess the effect of oral HAMS-AB for 4 weeks on glycemia, microbial metabolite and SCFA production in newly diagnosed (<2 years of diagnosis) youth with T1D. Thus far, we have enrolled 7 subjects with 1 early drop out due to nausea secondary to the prebiotic. The mean±SD age in the remaining 6 was 14.4±1.8 yrs, diabetes duration 18.6±6.3 months, 4/6 were female and White, all with BMI of <85th%. The prebiotic was safe and well-tolerated in all 6 who remained in the study. We assessed glycemia changes pre and post-intervention and the percent time in range (TIR) from continuous glucose monitoring data over a 4 week period increased significantly: 61. 0% vs. 71.8%, X2 18.2, p=0. 001. Stool SCFA levels were measured in 4 subjects, and butyrate levels increased post-prebiotic (8.1±9.8 vs 22.6± 6.4mmol SCFA/kg fecal material, p=0. 047). Serum and plasma Hippurate levels (a microbial metabolite associated with increased gut bacterial diversity and improved glycemia) increased significantly after 4 weeks of prebiotic consumption compared to before in all 6 individuals (p=0. 028 for serum and p=0. 033 for plasma, respectively). In summary, the prebiotic HAMS-AB was safe in adolescents with T1D. It significantly increased the percent TIR, serum and plasma Hippurate levels and stool butyrate levels. Enrollment continues as collection of samples from more participants should allow for a more conclusive analysis.

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