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Lowering sugar-sweetened beverage intake by children linked to favorable HDL-C changes

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In the first study to investigate blood lipid levels in association with consumption of sugar-sweetened beverages (SSBs) in a racially and ethnically diverse sample of Boston area schoolchildren, researchers found there was an inverse association between SSB intake changes and HDL-cholesterol increases (HDL-C is the "good cholesterol"). The study's results also showed that a higher intake of SSBs was associated with a higher triglyceride concentration.

Notably, the researchers found that reducing SSB intake by at least one serving a week was associated with a greater increase in HDL-C over a 12-month period. The findings reinforce the importance of minimizing consumption of SSBs among children and adolescents. The paper, published in *The Journal of Nutrition* on September 2, notes that additional longitudinal research is needed in large, multi-ethnic samples of children to better understand the health implications of reducing SSBs.

"A clustering of risk factors including high triglycerides, low HDL-C, insulin resistance, and obesity, especially if begun in childhood, puts one at higher risk for future cardiovascular disease. In this study, we sought to better understand the relationship between lipid levels and SSB consumption in a population of schoolchildren in which health disparities were likely, and where future interventions could help improve diet quality and disease risk," said Maria Van Rompay, PhD,

the first author on the study, and a research associate and instructor at the Friedman School of Nutrition Science and Policy at Tufts University.

While previous research has linked the intake of SSBs to greater cardiometabolic risk in adults, there is sparse longitudinal evidence in children. To add to the understanding of the phenomenon in children, the researchers examined the characteristics associated with consumption of SSBs in the multi-ethnic sample of children and adolescents, as well as mean SSB intake and changes in SSB intake with regard to key risk factors - plasma HDL-C and triglycerides - over a 12-month-period.

The impact of SSBs on obesity and other risk factors in children, including dyslipidemia (for example, a high level of triglycerides and low HDL-C in the blood) has been the subject of previous observational and descriptive studies. In addition, SSBs have been the main source of added sugars in children's diets in the U.S., accounting for as much as 10% of total energy intake (118 kcal for 6 to 11 year olds, 225 kcal for 12 to 19 year olds) in 2010.

In the new study, children ages 8 to 15 years were enrolled in a randomized, double-blind vitamin D supplementation trial, the Daily D Health Study, led by senior author Jennifer Sacheck, PhD, associate professor at the Friedman School of Nutrition Science and Policy at Tufts University. Baseline SSB intake was self-reported using the Block Food Frequency Questionnaire for Children, and fasting blood lipid concentrations were taken in 613 children and adolescents. Longitudinal measures were collected over 12 months in 380 of these youth. Sixty-eight percent of the children were from low socioeconomic status (SES) households; almost half were overweight or obese; 59% were from non-white/Caucasian racial/ethnic groups. Findings included:

- At baseline, approximately 85% of children/adolescents reported consuming SSBs during the past week. 18% of the sample consumed 7 or more servings per week, or approximately one serving or more daily.
- Greater SSB consumption was associated with older age, late puberty/post-puberty status and lower SES. SSB intake did not differ across racial and ethnic groups.
- Several characteristics did differ by race and ethnicity: puberty status, SES, body mass index (BMI) and sedentary time, along with HDL-C and triglyceride concentrations.
- Among 613 children/adolescents at baseline, higher triglycerides were linked with higher SSB intake, after accounting for demographic and behavioral factors, BMI, total calories and measures of diet quality.
- Over the 12-month period, the mean SSB intake was not associated with lipid changes; however, the increase in HDL-C was greatest among children who decreased their intake by one or more 12-oz. servings of SSBs per week compared to those whose intake stayed the same or increased.
- Greater SSB intake was associated with lower SES, higher total calorie consumption, lower fruit/vegetable intake, and a more sedentary lifestyle.

The researchers note that absence of an association between mean SSB intake and lipid changes over 12 months may be due to measurement error, e.g., possible misclassification of SSB intake or an under-reporting of SSBs especially from children who were overweight or obese.

Senior author Jennifer Sacheck commented, "Importantly, not only are most SSBs high in sugar and devoid of nutritional value, but they are displacing other foods and beverages that offer high nutritional quality, which are critical for children's growth and development, further exacerbating the potential harmful health effects of SSBs."

Provided by Tufts University