**Abstract**

**Background:** Studies suggest that higher consumption of added sugar is associated with cardiovascular risk factors in adolescents. However, these studies were subject to measurement error due to the lack of adjustment for day-to-day variability. **Hypothesis:** We hypothesized that higher usual percent of calories from added sugar is associated with dyslipidemia.

**Methods:** We analyzed data on 3322 adolescents aged 12-19 years who were not on low fat/low cholesterol diet or on sugar free/low sugar diet from the 2005-2010 National Health and Nutrition Examination Surveys. We estimated the usual percent of calories from added sugar from the diet accounting for measurement error. Multivariable linear regression was used to examine the associations between the percent of calories from added sugar with lipids profile. **Results:** The average usual percent of calories from added sugar was 17.5%. Ninety-one percent and 11% adolescents had usual percent ≥10% and ≥25%, respectively. After adjustment for potential confounders (age, sex, race/ethnicity, body mass index, parental educational attainment, smoking status, physical activity, 2010 Health Eating Index score except sugar component, and total calorie intake), usual percent of calories from added sugar was inversely associated with high-density lipoprotein and positively associated with triglycerides and the ratio of total cholesterol to high-density lipoprotein. Among the lowest and the highest quintiles of intake, high-density lipoprotein were 52.4 mg/dL (95% CI: 50.9 to 53.9) and 49.0 (95% CI: 47.9 to 50.2) (P trend = 0.003), triglycerides were 80.2 mg/dL (95% CI: 70.5 to 90.0) and 100.4 mg/dL (95% CI: 86.7 to 114.2) (P trend = 0.028), and the ratio of total cholesterol to high-density lipoprotein were 3.16 (95% CI: 2.8 to 3.6) and 3.49 (95% CI: 3.0 to 4.0) (P trend =0.006), respectively. The patterns of association were largely consistent across gender, race/ethnicity, and body mass index (normal vs. overweight/obese) subgroups, except in non-Hispanic black and Mexican American, in which the magnitude of the association tended to be smaller. Sensitivity analysis showed that, when intake data from the 1st 24-hour dietary recall was used, the association remained significant but attenuated substantially. No association was found for total cholesterol and low-density lipoprotein. **Conclusions:** Overwhelming majority of US adolescents consumed more added sugar than recommended for heart health. Increased intake of added sugar is associated with several measures of dyslipidemia, and reduction of added sugar consumption among adolescents might reduce the risk of developing cardiovascular disease in adults.

**Author Disclosure Block:**

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