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Lack of impact of SSB on indices of carbohydrate metabolism

Diabetes has long been viewed as a disorder of carbohydrate metabolism due to its hallmark feature of hyperglycemia. Insulin resistance is now recognized as a strong predictor of disease in adults and is the most profound hallmark of the metabolic syndrome and the subsequent development of Type II Diabetes. Of particular importance, fructose-induced insulin resistance has been previously shown in animals. However, the implications of findings for humans are unclear as these models typically use very high doses of fructose and from sources not commonly consumed. Therefore, little is known about how the typical consumption of fructose or sugar in general in humans affects insulin resistance, one of the primary defects in the development of frank diabetes.

This was a 6 month study in which all participants followed the ADA exchange diet as part of a weight maintenance program. In all, 66 participants were randomly assigned to one of three groups in which they were required to incorporate 2 servings per day of either 1) regular soda, 2) diet soda, or 3) water. Participants were screened for eligibility and underwent baseline measurements of weight, fasting glucose and insulin, and a standard 2 hour oral glucose tolerance test (OGTT). Area under the Curve (AUC) for the OGTT was determined by the trapezoidal method and insulin resistance was derived from the fasting values of glucose and insulin using the Homeostasis Model Assessment (HOMA-IR).

Measurements were performed again after 6 months.

Results: In the entire study population weight was unchanged ( $160.7 \pm 24.5$  vs  $161.4 \pm 24.2$  lbs,  $p > 0.05$ ), and was not affected by the type of beverage consumed. There were no changes in fasting glucose ( $89.7 \pm 5.2$  vs  $89.7 \pm 6.5$  mg/dl,  $p > 0.05$ ), insulin ( $7.3 \pm 4.4$  vs  $6.8 \pm 3.7$   $\mu$ IU/ml,  $p < 0.001$ ), HOMA-IR ( $1.6 \pm 1.0$  vs  $1.5 \pm 0.9$ ,  $p > 0.05$ ), Glucose AUC was unchanged ( $12.9 \pm 2.8$  vs  $13.1 \pm 2.8$  min\* $\mu$ g/dl,  $p > 0.05$ ). None of these measures were affected by the type of beverage consumed (interaction  $p > 0.05$ ).

These data suggest that when consumed as part of a balanced, energy controlled diet, the sugar and fructose delivered from 2 servings a day of regular soda does not promote negative changes in glucose and insulin metabolism.

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