No Changes In Plasma Uric Acid And Blood Pressure Following Ten Weeks Of Fructose Containing Sugar Consumption

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Introduction

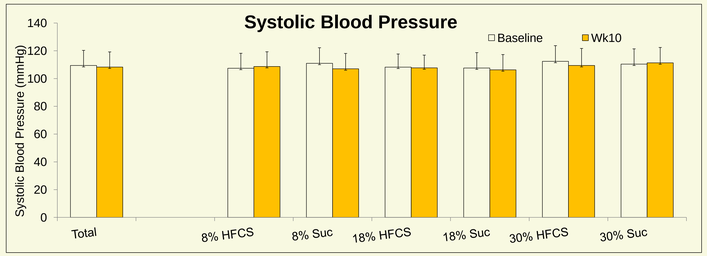
Hyperuricemia is promoted by consumption of very high doses of fructose, which in turn may increase blood pressure. This relationship has been clearly shown in rodent models, but has been observed while using doses of fructose high enough that make them inapplicable to human diets. The impact of fructose as commonly consumed by humans – in conjunction with other sugars and nutrients and in much lower amounts – has yet to be defined. The objective of this study was to examine the effects of daily consumption of either sucrose or HFCS-sweetened low fat milk on blood pressure and uric acid.

Methods

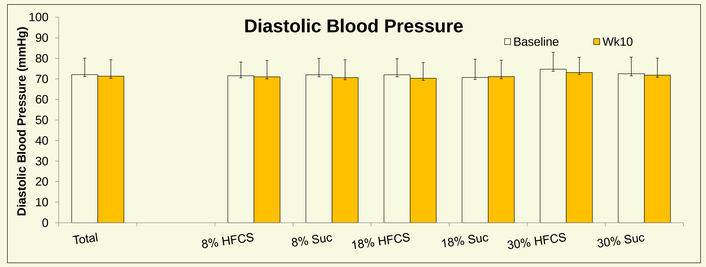
- Participants in this ten-week study (n=355) were men and women between 20-60 years, with a BMI between 21 and 35 kg/m^2.
  - Mean age 38.3 ± 11.3 years
  - Male=165, Female=190
- All participants were weight stable at the time of enrollment
  - No change in weight >3% of current weight within the past 30 days.
- The energy intake required to maintain weight was calculated for each participant and a prescription for the daily consumption of sugar sweetened, 1% fat milk set so that the added sugar contributed a certain percentage of the calories required for weight stability:
  - Groups 1 & 2 – Energy balanced containing 8% calories from HFCS or sucrose
  - Groups 3 & 4 – Energy balanced containing 18% calories from HFCS or sucrose
  - Groups 5 & 6 – Energy balanced containing 30% calories from HFCS or sucrose
    - 25^{th,} 50th, and 90th percentile of the population consumption levels for fructose respectively .
- A subset of participants (n=101) underwent a one-night stay in the metabolic unit, while consuming a calorie and macronutrient controlled diet containing sugars in the amount described above.
- Uric acid were measured every two hours for 24 hours and Area Under the Curve (AUC) calculated.

Results

Blood Pressure

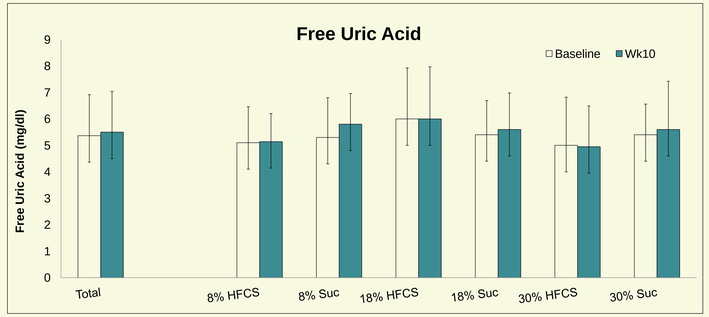


Systolic blood pressure did not change between baseline and week 10 (109.4 ±10.9 vs 108.3 ± 10.9).
- N=352
- Interaction effect (Time x Group) p>0.05
- Time effect, p>0.05



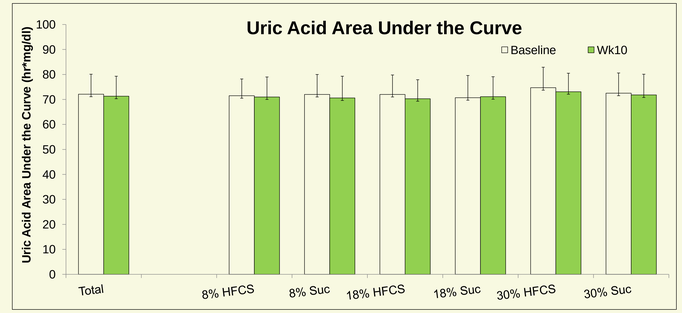
Diastolic blood pressure did not change between baseline and week 10 (72.1 ± 8.0 vs 71.3 ± 8.0).
- N=352
- Interaction effect (Time x Group) p>0.05
- Time effect, p>0.05

Fasting Uric Acid



Fasting uric acid did not change between baseline and week 10 (5.4 ± 1.6 vs 5.5 ± 1.5).
- N=106
- Interaction effect (Time x Group) p>0.05; Time effect, p>0.05

Metabolic Unit – Uric Acid



Uric acid AUC did not change between baseline and week 10 (105.5 ± 28.1 vs 105.7 ± 28.9).
- N=101
- Interaction effect (Time x Group) p>0.05; Time effect, p>0.05

Discussion & Conclusion

These data suggest that ten weeks of consumption of fructose at the 90th percentile level does not promote hyperuricemia, or increase blood pressure regardless of whether the fructose is consumed as high fructose corn syrup or as sucrose.

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