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The effects of apples and apple juice on acute plasma uric acid concentration: a randomized controlled trial

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ABSTRACT

Background

The consumption of large amounts of fructose from added sugars results in the hepatic production and export of uric acid into the circulation.

Objective

Our aim was to test whether fructose present in fruit is of sufficient quantity or in a form that will increase uric acid concentration.

Design

Seventy-three participants were randomly assigned to 1 of 3 groups to ingest small (205 g) and large (410 g) servings of apple segments, small (170 mL) and large (340 mL) servings of apple juice, or a glucose and a fructose control beverage. Within each group, participants ingested both treatments in a crossover design. The fructose control and the large servings of apple and juice contained 26.7 g fructose. Test foods were ingested within 10 min. Blood samples were taken at baseline and at 30 and 60 min after intake.

Results

Plasma uric acid concentrations increased after the intake of all fructose-containing treatments and decreased after the glucose beverage. The mean (95% CI) increase in uric acid at 30 min was 15 $\mu\text{mol/L}$ (10, 21 $\mu\text{mol/L}$) for the fructose control and 19 $\mu\text{mol/L}$ (8, 30 $\mu\text{mol/L}$) and 17 $\mu\text{mol/L}$ (9, 24 $\mu\text{mol/L}$) for the large servings of apple and apple juice, respectively. There was no difference in change in uric acid between baseline and 30 min when comparing the apple (3 $\mu\text{mol/L}$; 95% CI: -8, 14 $\mu\text{mol/L}$) and apple juice (-7 $\mu\text{mol/L}$; 95% CI: -18, 5 $\mu\text{mol/L}$) with the fructose control. Blood pressure taken 70 min after ingestion was unaffected by any treatment ($P > 0.05$). There was no difference in change in satiety scores between the fructose and glucose control beverages ($P > 0.05$). Participants felt more satiated 30 min after ingesting whole apple than after apple juice. The glycemic response reflected the amount of glucose in each treatment.

Conclusions

The body acutely responds to fructose regardless of source. Longer-term studies are required to assess how small and transient increases in plasma uric acid contribute to health. This trial was registered with the Australian New Zealand Clinical Trials Registry at <https://www.anzctr.org.au/trial/registration/trialreview.aspx?id=367974> as ACTRN12615000215527.

Keywords: fruit, fructose, uric acid, sugar, glycemia

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