HIGH-SUCROSE DIET INDUCES HYPERGLYCAEMIA AND ADIPOSITY INDEPENDENTLY OF URIC ACID LEVELS IN WISTAR RATS

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Several factors, including a high-fructose diet and the use of xenobiotics and alcohol, contribute to hyperuricaemia. The NHANES has demonstrated a significant association between elevated serum uric acid levels and the increased prevalence of abdominal obesity, hypertriglyceridaemia and hyperglycaemia. Thus, epidemiological studies have associated hyperuricaemia with metabolic syndrome. This study aims to evaluate the chronic effect of sucrose, a fructose source, on biochemical, nutritional and biometric parameters in rats. Wistar rats (~70g) received commercial diet and water ad libitum (control group – n = 12) and commercial and water containing 30% of sucrose ad libitum (sucrose group - n = 11) during 16 weeks. Every two days the water and food consumption were monitored. Animals were euthanized, organs removed and weighted (g) and the blood collected for measurement of serum biochemistry profile (mg/dL) using enzyme-colorimetric techniques. Data were analyzed by Student's t test, with \( P<0.05 \) as the criterion of significance. The food consumption was significantly higher in control, however caloric intake was similar. High-sucrose diet induced an increase in the blood glucose (103±4 vs. 120±7; \( P<0.05 \)), mass of the retroperitoneal (4±0.7 vs. 7±0.6; \( P<0.05 \)) and epididymal (6±0.6 vs. 8±0.8; \( P<0.05 \)) adipose tissue, visceral adiposity (2.6±0.2 vs. 3.9±0.2; \( P<0.05 \)) and weight gain rate in the last four weeks (3±0.2 vs. 4±0.3; \( P<0.05 \)), when compared to the control group. Additionally, the mass of the right (1.34±0.05 vs. 1.19±0.04; \( P<0.05 \)) and left (1.36±0.05 vs. 1.15±0.04; \( P<0.05 \)) kidneys were significantly lower in high-sucrose diet-fed rats. Serum uric acid (1.29±0.14 vs. 1.36±0.14), triglycerides (103±14 vs. 122±10) and cholesterol (83±4 vs. 89±11) and the mass of the heart (1.5±0.05 vs. 1.4±0.04) and liver (13±0.4 vs. 13±0.5); and the weight of the animals (378±11 vs. 390±12) did not differ between groups. These results suggest that excessive consumption of sucrose is linked to changes in serum glucose metabolism and tissue lipogenesis independently of serum uric acid levels.

Keywords: High-Sucrose Diet, Serum glucose metabolism, Visceral adiposity.

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