High-sugar Diet Induces Adipose Tissue Hypertrophy and Hepatic Steatosis in Adult Rats

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Introduction: The diet composition in early periods of development can result in changes in body that negatively impact the individual health, impairing, for instance, liver metabolism in adults. However, the effects of high-sugar diet (HSD) on relationship between adipose and hepatic metabolism have scarcely been investigated. This study aims to evaluate the long-term effects of an HSD on adipose tissue and liver homeostasis.

Material and Methods: Weaned Wistar rats (21 days) were fed with standard (STD) (N=14) or high-sugar (containing 33% sweetened condensed milk, HSD) (N=14) diets over a 12-week period. The rats were decapitated, and retroperitoneal adipose tissue and liver were removed for evaluation of cell size, and glucose, total cholesterol and triacylglycerol (TAG) levels were measured in serum.

Results and Discussion: Our results showed the same caloric intake and no differences in final weight gain. However, groups fed with an HSD displayed a higher adiposity index and rWAT weight (\(P < 0.05\)), while no change in liver weight. The adipocyte size was higher in HSD group e we observed steatosis in hepatocytes, with increase in Kupfer's cells. We observed an increased in TAG levels (65%), without changes in total cholesterol and serum glucose. Conclusions: Our results suggest that an HSD can induce retroperitoneal hypertrofia and affect liver homeostasis, increasing TAG production and causing steatosis with no change in diet intake and body weight.

Key words: adipose, diet, hepatic.

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