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Consumption of High Fat Diet Induces Obesity Associated to Hepatic Steatosis in Rats

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ABSTRACT

Introduction: The high intake of carbohydrates and lipids is one of factors that contribute to the onset of Metabolic Syndrome (MetS), a complex clinical situation which brings together, besides obesity, several cardiovascular and metabolic risk factors, including non-alcoholic fatty liver disease (NAFLD). **Objective:** To develop a hyperlipidemic dietetic animal model to obesity associated with NAFLD. **Methodology:** Male Rats Wistar (8 weeks old) were submitted to the standard diet (chow group, 11,8% kcal- lipids) and hypercaloric and hyperlipidemic during 8 weeks (HFD group, 58,4% kcal-lipids). After the dietary intervention, body weight, plasma and hepatic lipid profile (triglycerides, total cholesterol, VLDL and fatty acids) and adiposity index were evaluated. Moreover, histological assessment of hepatic lipid deposition and fibrosis, as well as the hepatic damage marker (alanine aminotransferase-ALT) were evaluated. **Results and Discussion:** Comparing to the chow group, HFD animals presented higher body weight, both in fasting and in the fed state, increased abdominal circumference, adiposity index, as well as plasma levels of total cholesterol and non-esterified fatty acids, characterizing the dietary phenotype of obesity. In addition, the HFD group had a significant decrease in brown adipose tissue, together with the lowest weight loss induced by 16h overnight fasting, suggesting a decrease in energy expenditure. In the liver, the HFD group presented a significant increase in the levels of triglycerides, cholesterol, VLDL and non-esterified fatty acids, and, qualitatively, increased lipid deposition and fibrosis. Together, these results associated with increased plasma ALT activity indicate NAFLD with hepatocyte damage. **Conclusion:** A high fat diet intake induces comorbidities that characterize MetS, such as obesity associated with decreased energy expenditure, as well as NAFLD.

Keywords: Hypercaloric diet; Hyperlipidic diet; Non-alcoholic fatty liver disease; Obesity

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