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Morphological Disorder Progression in Rat High-Fat, High-Carbohydrate Diet Induced Metabolic Syndrome

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High-fat-carbohydrate intake correlates with the epidemic rise in obesity and metabolic syndrome and related diseases. The aim of our work was to study the liver and mesenteric adipose tissue in rats with metabolic syndrome induced by high-fat-high-carbohydrate diet (HFHCD). Wistar rats (n = 10) were fed with HFHCD for 16 weeks. Control rats (n = 10) were on a normal diet. Metabolic control was determined by measuring BMI, adiposity, plasma parameter. Histopathological study was performed on the mesenteric adipose tissue and liver using PAS-reaction and Sudan-III-staining. Results: HFHCD increased body weight, BMI, adiposity, decreased HDL-cholesterol. Mesenteric adipose tissue was with larger adipocytes, liver steatosis and an increase in glycogen storage was also observed in the HFHCD group. In conclusion, nutritional stress caused by HFHCD promotes oxidative stress as evident by increased lipid peroxidation products and de novo lipogenesis which contributed to fat accumulation in the adipose tissue and the liver and to the development of non-alcoholic liver disorders.

Key words: metabolic syndrome, male rats, hepatic steatosis