Consumption of High-Fat Diet During Pregnancy and Lactation Modulates microRNA Involved in Control of Lipolitic Genes Expression

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INTRODUCTION: Obesity is associated with the development of a number of other diseases, particularly metabolic disorders. Recent studies have shown the relationship between the consumption of high-fat diet in pregnancy and lactation and liver lipid accumulation, hepatic insulin signaling reduction and serum cytokines increasing in offspring. miR-370, one microRNA involved in control of an important microRNA related to lipid metabolism (miR-122) showed altered expression in obese individuals, concomitant to altered expression of genes involved to lipogenesis and lipolysis. The present study investigated miR-370 and lipolytic genes expression in the liver of offspring from high-fat diet dams as a possible mechanism to understand how the exposure to an increased supply of nutrients before birth may contribute to offspring obesity.

MATERIAL AND METHODS: Liver samples from male offspring of high-fat diet dams (HFD-O) and standard chow dams (SC-O) at 28 days old were used to evaluate the expression of miR-370 and lipolytic genes (CPT1a and ACAD) using qRT-PCR.

RESULTS AND DISCUSSION: HFD-O mice present increased body weight (from 7th to 28th day), and intolerance to glucose. Liver miR-370 expression was downregulated in HFD-O (60%) compared to SC-O mice, concomitant to CPT1a (50%) and ACAD (40%) decreased.

CONCLUSIONS: The results of the present study showed that the consumption of a high fat diet during pregnancy and lactation lead to diminished expression of liver microRNA in the offspring that control expression of genes involved in lipidic metabolism. This result was accompanied by decreased expression of important lipolytic genes. This molecular alteration may be related to the fatty liver observed in the adult offspring of dams fed with a high fat diet during pregnancy and lactation.

Key words: maternal obesity; lipidic metabolism, miR370.
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