Dams Fed High-Fat Diet During Pregnancy and Lactation: Implications in Hepatic microRNA and Lipogenic Genes Expression in Offspring

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INTRODUCTION: Obesity is highly associated with excessive consumption of a high-fat diet (HFD). Recent studies using a model of diet-induced obesity showed the relationship to microRNA expression and metabolic disturbance. miR-122, an important microRNA related to lipid metabolism, highly expressed in liver, showed altered expression in obese, concomitant to altered expression of lipogenic genes. It is important to understanding whether the conditions for development of the fetus in obese mothers could contribute to the microRNAs activation that promote metabolic damage observed in the adult offspring. MATERIALS AND METHODS: For the present study was used male Swiss mice (28 days), from dams that consumed either control diet (SC-O) or high fat diet (HFD-O) during pregnancy and lactation. After weaning, both were fed with control diet for 7 days. Liver fragments were used to evaluate the expression of miR-122 using qRT-PCR. Lipogenic proteins (FAS, SCD-1, HMGCR, pACC) were also investigated using qRT-PCR and/or Western Blot technique (WB). RESULTS AND DISCUSSION: HFD-O mice presented increased body weight (from 7th to 28th) compared to SC-O. Furthermore, the results obtained by RT-PCR and WB showed higher HMGCR (1.5-fold to WB and 1.46-fold to RT-PCR), SCD-1 (1.3-fold WB and 2.19–fold to RT -PCR) and FAS (2.19-fold to WB and 2.3-fold to RT-PCR) expression in liver of HFD-O than SC-O mice. The liver expression of miR-122 and pACC in HFD-O was lower (77.31% and 20%) respectively than SC-O mice. 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 miR-122 in the offspring. This result was accompanied by increased expression of lipogenic 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, mir-122, lipogenesis
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