MATERNAL OBESITY DURING GESTATION AND/OR LACTATION CAN INDEPENDENTLY ALTER HEPATIC LIPID HOMEOSTASIS THROUGH MICRO-RNAS EXPRESSION IN YOUNG MICE OFFSPRING

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Introduction and objectives: Overnutrition during gestation and lactation plays a critical role in metabolic phenotype of offspring and is associated with insulin resistance and NAFLD. However, the contribution of the pre- or post-natal period to the metabolic programming of lipid homeostasis in the liver is still controversial. In the present study, we aimed to investigate the contribution of maternal HFD consumption during critical developmental periods on hepatic lipid metabolism disturbance in offspring.

Material and Methods: Control or obese female Swiss mice were mated with control male Swiss mice. At d0, newborn pups of obese mice (H) and control (C) were evaluated. Some pups were randomly assigned to two foster conditions: unfostered: pups fostered by their own control or obese dams (CC and HH, respectively), and crossfostered: pups from control dams fostered by H dams (CH) or pups from obese dams fostered by control dams (HC) and, after one week (d28) they were evaluated. For both groups (d0 and d28) we analyzed body weight and adiposity, serum parameters, gene expression (qRT-PCR) of Cpt1a, Acadvl, Agpat, Gpam, miR-122 and miR-370 and immunoblot to analyze proteins in liver fragments.

Results and Conclusion: At d0 H showed lower body weight, higher fasting glucose, decreased Cpt1a and Acadvl, increased Agpat and Gpam, decreased miR-122 and increased miR-370 hepatic expression than C group. At d28 HC presented increased adiposity, CHOL levels and Agpat and Gpam expression in liver, in comparison to crossfostered CH. miR-122 liver expression was diminished in both CH and HC in comparison to CC. In conclusion, liver expression of miR-122 seems to be modulated by fatty acids present in maternal serum and milk. However, the effects of gestational overnutrition in offspring appear to be more harmful, resulting in increased triglycerides synthesis from birth to weaning.

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Key Words: maternal obesity, lipid metabolism, miR-122