Eating “junk food” during pregnancy and lactation impairs skeletal muscle development and metabolism in rat offspring at weaning
(Fütterung von Diäten mit geringem Nährwert ("junk food") an Ratten während der Schwangerschaft und Laktation beeinflusst die Skelett-muskelentwicklung und den Stoffwechsel der Nachkommen beim Absetzen negativ)

The influence of a maternal cafeteria diet on the development of skeletal muscle and adipose tissue was examined in rat offspring at weaning (21 day post-partum). Pregnant rats were divided into three groups and were either fed a cafeteria diet (high fat, high sugar, high calorie) during both gestation and lactation or the cafeteria diet during gestation alone followed by a balanced chow diet during lactation or the chow diet during gestation and lactation. Pups from mothers fed the cafeteria diet during gestation and lactation exhibited a 25% reduction in muscle cross-sectional area with around 20% fewer fibers at weaning when compared with pups born to mothers fed the balanced chow diet during both gestation and lactation. These pups also exhibited increased adiposity i.e. increased fat pad weights as well as elevated intramuscular lipid content accompanied by increased muscle IGF-1, IGF-1 receptor, and PPARγ mRNA levels which could indicate an attempt to maintain normal insulin sensitivity. Pups fed the cafeteria diet during gestation and rehabilitated to the balanced chow diet during lactation did not exhibit the increased adiposity and elevated IGF-1, IGF-1 receptor and PPARγ mRNAs. However, they exhibited reduced muscle cell proliferation (PCNA), reduced insulin receptor mRNA and a trend towards reduced glucose transporter (GLUT)-4 mRNA when compared with pups fed chow throughout the experiment; this may indicate a possible reduction in glucose up-take by muscle tissue. In conclusion, a maternal cafeteria diet either during gestation alone or during both gestation and lactation affected skeletal muscle development and induced metabolic disorders normally associated with insulin resistance in rat offspring at weaning.

Reference

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