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高脂饮食诱导母系肥胖对雄性子代大鼠血清生殖激素的影响

摘要

目的: 在本研究中, 我们建立了高脂饮食诱导的母系肥胖大鼠模型, 观察雄性子代大鼠血清生殖激素的动态变化规律及特点, 对肥胖组与基础组子代雄鼠血清生殖激素进行比较, 发现血清生殖激素程度的不同, 进而讨论母系肥胖对雄性后代生殖功能的影响。**方法:** 80 只 7 周龄 SPF 级 Wistar 雌鼠, 体重 (180±20) g, 适应性喂养 2 天, 高脂饲养喂养 2 周。根据体重增加量降序排序, 取体重增重量上 1/3 为饮食诱导肥胖 (DIO 组) 鼠, 增重量中 1/3 作为正常对照 (CON 组) 鼠。DIO 组和 CON 组分别喂养 6 周高脂饲料和基础饲料。25 只 4 周龄 SPF 级 Wistar 雄鼠, 体重 (110±10) g, 适应性喂养 2 天, 高脂饲料喂养 2 周。根据体重增加量降序排序, 取中间 1/3 鼠作为父系 CON 组。随机选取雌性大鼠 DIO 组 10 只与雄性大鼠 CON 组 5 只每晚按 2:1 比例合笼交配, 从雌性大鼠 CON 组中随机选取 8 只与雄性大鼠 CON 组中随机选取 4 只每晚按 2:1 比例合笼交配。子代雄鼠哺乳期后, 随机选取基础组和肥胖组 10 只雄性子代小鼠, 基础饲料喂养至 12 周。运用酶联免疫吸附测定法 (ELISA) 检测大鼠血清生殖激素 (雌二醇、促黄体生成素、卵泡刺激素、睾酮) 程度。**结果:** 母系肥胖会使雄性子代体重升高的可能性增加。肥胖组雄性子代大鼠血清生殖激素睾酮水平与基础组睾酮水平差异具有统计学意义 ($P<0.05$), 而肥胖组雄性子代大鼠卵泡刺激素、促黄体生成素和雌二醇与基础组生殖激素水平差异均无统计学意义 ($P>0.05$)。**结论:** 母系肥胖对雄性子代的体重有产生了影响; 母系肥胖使子代雄性大鼠体内的睾酮浓度升高, 对雄性子代大鼠的生殖有一定的影响。

【关键词】 高脂饮食; 母系肥胖; 子代; 生殖激素

Effects of high fat diet on maternal obesity and serum reproductive hormones in male offspring rats

Abstract

Objective: In this study, we established a high-fat diet, it induced maternal obesity rats models, we observed the male offspring rats serum reproductive hormones of the dynamic change rules and characteristics of the obese group and foundation offspring male mice serum reproductive hormones were compared, found that the difference in the level of serum reproductive hormones, and discuss the influence of maternal obesity on the male offspring reproductive function. **Methods:** Eighty 7-week-old SPF Wistar females, weighing 180 ± 20 g, were given adaptive feeding for 2 days and high-fat feeding for 2 weeks. In descending order of weight gain, 1/3 of weight gain was taken as diet-induced obesity (DIO) group, and 1/3 of weight gain was taken as normal control (CON) group. The DIO group was fed high-fat diet for 6 weeks, and the CON group was fed basic diet for 6 weeks. 25 male SPF Wistar rats were 4 weeks old and weighed (110 ± 10) g. They were given adaptive feeding for 2 days and high-fat feeding for 2 weeks. According to the descending order of weight gain, the middle 1/3 mice were selected as the paternal CON group. Ten female rats in the DIO group and five male rats in the CON group were randomly selected to mate in cages at a ratio of 2:1 per night, and eight female rats in the CON group and four male rats in the CON group were randomly selected to mate in cages at a ratio of 2:1 per night. After lactation, we selected randomly 10 male offspring mice in the basal group and the obese group. Then we fed them with basal feed for 12 weeks. Finally we used enzyme-linked immunosorbent assay (ELISA) to calculate the serum levels of reproductive hormones (estradiol, luteinizing hormone, follicle stimulating hormone, testosterone) **Results:** TMaternal obesity increases the likelihood of male offspring becoming obese. The reproductive hormone testosterone in the obese group of the serum were significantly different from those in the basal

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