

## 论文

### 高脂肪膳食对肥胖大鼠学习记忆能力影响

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#### 摘要:

**目的** 探讨高脂肪膳食诱导的肥胖大鼠学习记忆能力变化。**方法** 健康雄性SD大鼠50只,随机选取10只,通过皮下注射D-半乳糖,建立大鼠学习记忆损伤模型,喂基础饲料(阳性对照组),其余动物高脂肪饲料连续喂养2周后,根据体重筛选出基础组大鼠10只,喂基础饲料,其余大鼠继续喂高脂肪饲料,10周后,再根据体重筛选出肥胖大鼠10只,采用Morris水迷宫方法检测大鼠学习记忆能力,处死动物后,测量体脂肪含量,收集血清,检测血脂指标。**结果** 肥胖大鼠体重、肾周脂肪、睾周脂肪、网膜脂肪、体脂肪含量均明显高于基础组大鼠,血脂水平无明显变化;阳性对照组大鼠第3象限平均逃避潜伏期(18.54±2.73) s和总路程(298.60±48.18) cm明显高于基础组[分别为(8.27±1.82) s、(124.85±29.17) cm]( $P<0.05$ );与基础组比较,肥胖组大鼠第3象限平均逃避潜伏期和总路程[分别为(9.72±2.19)s、(166.31±37.12) cm]具有升高趋势。各组大鼠穿越平台次数差异无统计学意义。**结论** 高脂肪膳食诱导的肥胖大鼠可能存在学习能力损伤。

**关键词:** 高脂肪膳食 肥胖大鼠 学习记忆能力

### Learning and memory ability of rats with high-fat diet-induced obesity

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#### Abstract:

**Objective** To investigate the learning and memory ability of rats with obesity induced by high-fat diet. **Methods** According to body weight, 10 Sprague-Dawley (SD) rats (SPF grade) were randomly selected from 50 SD rats and were administered D-galactose subcutaneously once a day for ten weeks and fed with basal diet to establish a rat model of learning and memory impairment and a positive control group. The other 40 rats were fed with high-fat diet for 2 weeks, of which 10 control rats were selected according to their body weight and fed with basal diet, while the other 30 rats were fed with high-fat diet. Ten weeks later, another 10 obese rats were also selected according to their body weight from the 30 obese rats. Morris water maze was used to determine learning and memory ability of the rats. Serum samples were collected for serum lipid measurement. **Results** The body weight, perirenal fat, inguinal fat, omental fat, and body fat content of obese rats were significantly higher than those in the rats of other groups. Blood lipid level in different groups showed no significant difference. The escape latency (18.54±2.73 s) and total distance (298.60±48.18 cm) in positive control group were increased compared to those in the control group (8.27±1.82 s, 124.85±29.17 cm), respectively ( $P<0.05$  for all). The escape latency and total distance in the 3rd quadrant were 9.72±2.19 s and 166.31±37.12 cm for the rats of obesity group, with a non-significant increase tendency compared to the rats of control group. In addition, the frequency of crossing the platform for the rats in different groups showed no change. **Conclusion** Learning ability may be impaired in rats with obesity induced by high fat diet.

**Keywords:** high-fat diet obese rat learning and memory ability

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