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基础医学

不同浓度谷氨酸钠摄入对Wistar大鼠代谢及胰岛细胞凋亡的影响

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摘要:

目的 探索不同浓度谷氨酸钠(MSG)摄入对大鼠代谢及胰岛细胞凋亡的影响。**方法** 将40只Wistar大鼠随机分为对照组、MSG标准剂量组、MSG 4倍标准剂量组、MSG 8倍标准剂量组, 每组10只。对照组给予生理盐水灌胃, MSG组给予自配的MSG溶液灌胃, 每周空腹取尾静脉血1次, 测血糖、甘油三酯、总胆固醇水平, 于33周取颈动脉血测其血糖、胰岛素、甘油三酯、总胆固醇水平。**结果** 不同组间血糖水平差异无统计学意义($P > 0.05$), 但MSG 8倍标准剂量组与其他3组比较, 甘油三酯、总胆固醇、胰岛素水平均明显升高, 差异有统计学意义($P < 0.05$), MSG 8倍标准剂量组的胰岛素抵抗指标与其他3组相比, 差异有统计学意义($P < 0.05$), 说明该组出现了胰岛素抵抗; 各MSG组均造成胰岛细胞的形态学改变, 且随着MSG浓度的升高, 胰岛细胞的凋亡率也逐渐升高, 8倍MSG剂量组与其他组相比, 差异有统计学意义($P < 0.05$)。**结论** 高剂量MSG摄入会造成代谢紊乱并损伤胰岛功能, 一旦胰岛功能由胰岛素抵抗发展至胰岛失代偿, 可能会引发高血糖。

关键词: 谷氨酸钠; 血糖; 胰岛素; 糖尿病

Effects of different concentrations of MSG on the metabolism and islet cell apoptosis in Wistar rats

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Abstract:

Objective To explore the effects of different concentrations of monosodium glutamate (MSG) on the metabolism and islet cell apoptosis in rats. **Methods** Forty Wistar rats were randomly divided into four groups: the control group, the MSG normal dose group, the MSG four times dose group and the MSG eight times dose group, each with 10 rats respectively. The rats in the control group and other three groups were administered intragastrically with normal saline and homemade MSG solution, respectively. Fasting glucose, triglycerinate and total cholesterol were examined each week from the aft venous blood and the carotid arterial blood was collected to test fasting glucose, insulin, triglycerinate and total cholesterol at week 33. **Results** There was no statistical difference in fasting glucose among the four groups ($P > 0.05$). However, compared with the other three groups, the MSG eight times dose group had higher levels of insulin, triglycerinate and total cholesterol, and the difference had statistical significance ($P < 0.05$). The insulin resistance was also shown in that group ($P < 0.05$). In the MSG groups, all doses of MSG caused the morphological changes of islet cells, and with the increasing of MSG, the apoptotic rates of islet cell also increased. But only the difference between the MSG eight times group and the other three groups had statistical significance ($P < 0.05$). **Conclusion** High dose of MSG could cause metabolic disorders and impair the function of islet. Hyperglycemia would occur if the islet was decompensated.

Keywords: Monosodium glutamate; Glucose; Insulin; Diabetes

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