

论著

血糖波动与持续性高血糖对糖尿病大鼠肾脏病理改变及IV型胶原表达的影响

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摘要: 目的: 观察血糖波动与持续性高血糖对糖尿病大鼠肾脏病理改变及IV型胶原(Col IV)表达的影响。方法: 将60只SD雄性大鼠随机分为正常组和模型组,正常组大鼠喂以普通饲料,模型组大鼠高糖高脂饲料喂养6周后予以小剂量链脲佐菌素(STZ,30mg/kg)皮下注射制造糖尿病大鼠模型。再将糖尿病组大鼠随机分为持续性高血糖组和血糖波动组,其中血糖波动组给予每日两次皮下注射胰岛素人为诱导血糖波动。3个月后将大鼠剖腹取出肾,行HE染色、PAS染色、Col IV免疫组织化学及Western印迹检测。结果: 与正常组大鼠比较,模型组大鼠肾小球体积增大、毛细血管内皮细胞基底膜增厚、系膜基质增多、肾小球囊腔扩张,肾小管体积增大、肾小管管腔扩张、上皮细胞基底膜增厚,肾小球通透性增强,肾脏病理形态改变明显;肾肥大指数增加、肾小球硬化指数增加、Col IV表达量明显增加($P<0.01$)。与持续性高血糖组比较,血糖波动组大鼠上述指标变化更为明显($P<0.05$)。结论: 糖尿病大鼠出现了肾小球基底膜增厚、系膜基质增多等病理形态的改变,血糖波动组肾小球硬化更明显,Col IV的增多可能与糖尿病肾病的严重程度有关。

关键词: 血糖波动 糖尿病肾病 IV型胶原

Effect of blood glucose fluctuation and the sustained high blood glucose on renal pathological change and collagen IV expression in diabetic rats

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Abstract: Objective: To observe the effect of blood glucose fluctuation and the sustained high blood glucose on renal pathological change and collagen IV (Col IV) expression in diabetic rats. Methods: The 60 male Sprague-Dawley (SD) rats were randomly assigned into a normal control group (NC) and a model group (DM). The rats in the normal control group were fed with normal diet, while the rats in the model group were fed with high-sucrose-high-fat diet for 6 weeks. After that, streptozocin (STZ, 30mg/kg) was injected to induce diabetic model. The model group was then randomly divided into 2 subgroups: a sustained high blood glucose group and a fluctuation blood glucose group (animals in the latter group were subcutaneously injected with insulin twice daily). Rats were sacrificed after 3 months and kidney tissues were dissected for HE and PAS staining, Col IV immunohistochemistry and Western blot. Results: Compared with the normal control group, the renal glomeruli and capillary basal membrane in the diabetic rats was getting larger and thicker, respectively; the capsular space and ground substance was extended and increased, respectively; the volume of renal tubule, kidney hypertrophy index, glomerular sclerosis index and Col IV content were all increased in the diabetic rats ($P<0.01$). Compared with the sustained high blood glucose group, the above mentioned pathological changes were more serious in the blood glucose fluctuation group. Conclusion: The capillary basal membrane of kidney in diabetic rats is thicker and the ground substance is increased. The degree of glomerular sclerosis is more serious in the blood glucose fluctuation group compared with the sustained high blood glucose group, which is confirmed by the increased level of Col IV.

Keywords: blood glucose fluctuation diabetic nephropathy collagen IV

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