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蛋氨酸亚砷还原酶B1在糖尿病小鼠肾脏中的表达变化及其与氧化应激的关系

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Expression changes of methionine sulfoxide reductase B1 in the kidneys of instreptozocin-induced diabetic mice and its relationship with oxidative stress

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摘要/Abstract

**摘要：** **目的** 探讨链脲佐菌素 (STZ) 诱导的糖尿病小鼠肾组织中蛋氨酸亚砷还原酶B1 (MsrB1) 的表达变化及其与氧化应激的关系。**方法** 将10周龄雄性C57BL/6小鼠随机分为4组：正常对照组 (NC组)、单侧肾切除组 (UX组)、STZ组和单侧肾切除加STZ组 (STZ-UX组)。

模型制备后第8周末, 免疫组化法检测MsrB1在肾组织中的表达和分布; 实时定量PCR、Western blotting检测MsrB1 mRNA及蛋白水平的变化; 通过丙二醛 (MDA)、蛋白羰基 (PC) 和总巯基 (TSH) 试剂盒检测氧化损伤情况。**结果** MsrB1表达于小鼠肾小管上皮细胞的细胞核和细胞质。与NC组相比, STZ组和STZ-UX组MsrB1表达量和TSH含量减少 ( $P<0.05$ ), 而MDA、PC含量增加 ( $P<0.05$ ), 且STZ-UX组比STZ组变化更明显; UX组没有明显改变 ( $P>0.05$ )。相关性分析结果显示, STZ组和STZ-UX组MsrB1蛋白表达与MDA和PC呈负相关 ( $P<0.05$ ), 与TSH含量呈正相关 ( $P<0.05$ )。**结论** 在STZ诱导的糖尿病小鼠肾组织中, MsrB1表达明显减少, 这种变化可能参与了糖尿病肾病 (DN) 氧化应激的发生。

**关键词:** 氧化应激, 糖尿病肾病, C57BL/6小鼠, 蛋氨酸亚砷还原酶B1

**Abstract: Objective** To determine the expression changes of methionine sulfoxide reductase B1 (MsrB1) in the kidneys of streptozotocin (STZ)-induced diabetic mice and to investigate its relationship with oxidative stress. **Methods** Ten-week-old male C57BL/6 mice were randomly divided into four groups: normal control mice group (NC group), unilaterally nephrectomized mice group (UX group), STZ-induced diabetic mice group (STZ group) and STZ mice with unilateral renal ablation group (STZ-UX group). At the end of the 8<sup>th</sup> week after the construction of the model, immunohistochemistry detected MsrB1 expression and distribution in the kidney tissues. The mRNA and protein levels of MsrB1 were determined by real-time PCR and Western blotting. The levels of oxidative stress in the kidneys of four groups were measured by the kits of malondialdehyde (MDA), protein carbonyl (PC) and total sulfhydryl groups (TSH). **Results** MsrB1 was located in the nucleus and cytoplasm of the renal tubular epithelial cells in mice. Compare with NC group, the mRNA and protein levels of MsrB1 and the content of TSH in the kidneys of STZ group and STZ-UX group were lower, the contents of MDA and PC were higher ( $P<0.05$ ) and STZ-UX group was more obvious; there was no significant change in UX group ( $P>0.05$ ). Correlation analysis showed that in the STZ group and STZ-UX group, MsrB1 protein expressions were negatively correlated with MDA and PC ( $P<0.05$ ), and positively correlated with TSH levels ( $P<0.05$ ). **Conclusion** The expression of MsrB1 decreases significantly in the kidneys of STZ-induced diabetic mice, which may play an important role in the oxidative stress of diabetic nephropathy.

**Key words:** Methionine sulfoxide reductase B1, Oxidative stress, C57BL/6 mice, Diabetic nephropathy

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