

论文

水飞蓟宾对异丙肾上腺素引起的大鼠乳鼠心肌细胞损伤的保护作用及其机制

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摘要:

水飞蓟宾(silibinin)为从菊科植物水飞蓟(*Silybum marianum*)的种子和果实中提取得到的黄酮类单体成分。本研究观察水飞蓟宾对β-肾上腺素受体激动剂异丙肾上腺素对培养乳鼠心肌细胞损伤的影响, 并对其机制进行研究。采用MTT法测定细胞存活率, 酶联法测定细胞丙二醛(maleic dialdehyde, MDA)和细胞培养液中乳酸脱氢酶(lactate dehydrogenase, LDH)的含量以及超氧化物歧化酶(superoxide dismutase, SOD)的活性, 流式细胞仪测定线粒体膜电位(Δψ), 以及Western blotting检测与线粒体相关蛋白的表达。与模型组相比, 水飞蓟宾使细胞受损伤的程度降低, 并且增加SOD的活性, 抑制了细胞膜电位的降低, 并且改善Bcl-2家族蛋白中Bax/Bcl-2的表达比率, 上调Bax上游去乙酰化酶SIRT1蛋白的表达。水飞蓟宾通过上调线粒体上游Bax/Bcl-2的表达比率与SIRT1蛋白的表达, 改善了线粒体的功能, 从而对由异丙肾上腺素引起的培养乳鼠心肌细胞损伤有明显的保护作用。

关键词: 水飞蓟宾 心肌细胞 损伤 线粒体膜电位 Bcl-2家族蛋白 SIRT1

Protective effect of silibinin against isoproterenol-induced injury to cardiac myocytes and its mechanism

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Abstract:

Silibinin is a polyphenolic flavanoid derived from fruits and seeds of milk thistle (*Silybum marianum*). To investigate the effect and mechanism of silibinin on β-isoproterenol-induced rat neonatal cardiac myocytes injury, the viability, the activation of lactate dehydrogenase (LDH) and the content of maleic dialdehyde (MDA) were chosen for measuring the degree of cardiac myocytes injury. Superoxide dismutase (SOD) activity, mitochondrial membrane potential (Δψ) detected by flow cytometric analysis, and Western blotting analysis were applied to determine the related proteins. Silibinin protected isoproterenol-treated rat cardiac myocytes from death and significantly decreased LDH release and MDA production. Silibinin increased superoxide dismutase (SOD) activity, and increased mitochondrial membrane potential (Δψ). Furthermore, the release of pro-apoptotic cytochrome c from mitochondria was reduced by silibinin. Silibinin increased the expression of anti-apoptotic Bcl-2 family protein Bcl-2, and up-regulation of SIRT1 inhibited the translocation of Bax from cytoplasm to mitochondria, which caused mitochondrial dysfunction and cell injury. Silibinin protects cardiac myocytes against isoproterenol-induced injury through resuming mitochondrial function and regulating the expression of SIRT1 and Bcl-2 family members.

Keywords: cardiac myocyte injury mitochondrial membrane potential Bcl-2 family proteins SIRT1 silibinin

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