

药理学专栏

降钙素基因相关肽通过调节microRNA-1和microRNA-133a的表达抑制异丙肾上腺素诱导的心肌细胞凋亡

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摘要:

目的: 探讨降钙素基因相关肽(CGRP)对心肌细胞凋亡的抑制作用及其潜在的机制。方法: 异丙肾上腺素(10^{-5} mol/L)孵育48 h以诱导体外培养的大鼠心肌细胞凋亡,不同浓度的CGRP(10^{-8} 或 10^{-7} mol/L)在异丙肾上腺素孵育前1 h给药。药物处理结束后,检测心肌细胞凋亡率和细胞内活性氧的水平以及microRNA-1和microRNA-133a表达的变化。结果: 异丙肾上腺素能显著增加心肌细胞的凋亡和细胞内活性氧的产生,同时伴随着microRNA-1表达的上调和microRNA-133a表达的下调,预先给予CGRP可显著抑制异丙肾上腺素的上述效应,但CGRP的有益效应可被CGRP受体拮抗剂所取消。结论: CGRP可抑制异丙肾上腺素诱导的心肌细胞凋亡,其机制可能与抑制活性氧的产生进而调节microRNA-1和 microRNA-133a的表达有关。

关键词: 降钙素基因相关肽 异丙肾上腺素 心肌细胞 凋亡 活性氧 microRNA-1 microRNA-133a

Calcitonin gene-related peptide suppresses isoprenaline-induced cardiomyocyte apoptosis through regulation of microRNA-1 and microRNA-133a expression

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Abstract:

Objective To explore the inhibitory effect of calcitonin gene-related peptide (CGRP) on cardiomyocyte apoptosis and the underlying mechanism. Methods In cultured rat cardiomyocytes, apoptosis was induced by the incubation of isoprenaline (10^{-5} mol/L) for 48 h. CGRP (10^{-8} or 10^{-7} mol/L) was administrated for 1 h before incubating isoprenaline to evaluate its effect on cardiomyocyte apoptosis. At the end of the drug treatment, the rate of apoptotic cells and intracellular reactive oxygen species (ROS) were determined, and RNA was extracted to examine the expression of microRNA-1 and microRNA-133a. Results Isoprenaline significantly increased the rate of apoptotic cells and intracellular ROS production concomitantly with the increased microRNA-1 expression and the decreased microRNA-133a expression, which were inhibited by pretreatment with CGRP. The effects of CGRP were reversed by CGRP receptor antagonist. Conclusion CGRP can inhibit the isoprenaline-induced cardiomyocyte apoptosis. The beneficial effect of CGRP is related to regulating microRNA-1 and microRNA-133a expression through the prevention of isoprenaline-induced ROS production.

Keywords: calcitonin gene-related peptide isoprenaline cardiomyocyte apoptosis reactive oxygen species microRNA-1 microRNA-133a

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