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◇ 药学研究 ◇



氟伐他汀调控 Sirt3 对过氧化氢诱导的骨髓间充质干细胞增殖凋亡的影响

张承中¹,尹占海²,李存宽³,王成龙³

作者单位:¹海东市人民医院骨科,青海 海东 810600;

²青海省中医医院骨科,青海 西宁 810000;

³海东市平安区中医医院骨科,青海 海东 810600

摘要: **目的** 探讨氟伐他汀对过氧化氢诱导的骨髓间充质干细胞(BMSCs)增殖凋亡的影响及作用机制。**方法** 用400 $\mu\text{mol/L}$ 的过氧化氢处理 BMSCs 作为模型组;BMSCs 用400 $\mu\text{mol/L}$ 的过氧化氢培养的同时分别加入0.01、0.1、1 $\mu\text{mol/L}$ 氟伐他汀作为干预组;未添加任何物质正常培养的细胞作为正常组;将 si-NC、si-Sirt3 转染至 BMSCs 中再用400 $\mu\text{mol/L}$ 的过氧化氢、0.1 $\mu\text{mol/L}$ 氟伐他汀处理作为干预组2+si-NC 组、干预组2+si-Sirt3 组。蛋白质印迹(Western Blotting)法检测 Sirt3 蛋白表达水平;四甲基偶氮唑盐比色法(MTT)检测细胞存活率;流式细胞术检测细胞凋亡。**结果** 与正常组相比,模型组 BMSCs 细胞存活率降低[(41.57 \pm 4.32)%比(100.40 \pm 10.23)%],细胞凋亡率升高[(38.57 \pm 4.04)%比(8.28 \pm 0.92)%],Sirt3 表达水平降低[(0.31 \pm 0.03)比(1.01 \pm 0.10)],均差异有统计学意义($P<0.05$);与模型组相比,氟伐他汀干预组细胞存活率明显升高细胞凋亡率降低,Sirt3 表达水平升高,均差异有统计学意义($P<0.05$)。提示抑制 Sirt3 能逆转氟伐他汀对过氧化氢诱导的 BMSCs 细胞增殖抑制和凋亡促进作用。**结论** 氟伐他汀能抑制过氧化氢诱导的 BMSCs 细胞凋亡,其机制可能与上调 Sirt3 有关。

关键词: 间质干细胞; 氟伐他汀; Sirt3; 过氧化氢; 骨髓间充质干细胞; 增殖; 凋亡

Effect of fluvastatin on proliferation and apoptosis of bone marrow mesenchymal stem cells induced by hydrogen peroxide

ZHANG Chengzhong¹,YIN Zhanhai²,LI Cunkuan³,WANG Chenglong³

Author Affiliations:¹Department of Orthopaedics, Haidong people's Hospital, Haidong, Qinghai 810600, China;

²Department of Orthopaedics, Qinghai Hospital of traditional Chinese medicine, Xining, Qinghai 810000,China,³Department of Orthopaedics,Pingan District Hospital of Traditional Chinese Medicine, Haidong, Qinghai 810600, China

Abstract: **Objective** To investigate the effect and mechanism of fluvastatin on proliferation and apoptosis of bone marrow mesenchymal stem cells (BMSCs) induced by hydrogen peroxide.**Methods** BMSCs were treated with 400 $\mu\text{mol/L}$ hydrogen peroxide as a model group; BMSCs were cultured with 400 $\mu\text{mol/L}$ hydrogen peroxide while adding 0.01, 0.1, 1 $\mu\text{mol/L}$ fluvastatin as intervention group; normal cultured cells without any additives served as normal group; BMSCs transfecte with si-NC and si-Sirt3 and treated with 400 $\mu\text{mol/L}$ hydrogen peroxide and 0.1 $\mu\text{mol/L}$ fluvastatin were designated as intervention group 2+si-NC group, intervention group 2+si-Sirt3 group. The expression of Sirt3 protein was detected by Western Blot; cell viability was detected by MTT assay; cell apoptosis was detected by flow cytometry.**Results** Compared with normal group, the cell survival rate of BMSCs in model group was significantly decreased [(41.57 \pm 4.32) % vs. (100.40 \pm 10.23) %], the apoptosis rate was significantly increased [(38.57 \pm 4.04) % vs. (8.28 \pm 0.92) %], and the expression of Sirt3 was significantly decreased [(0.31 \pm 0.03) vs. (1.01 \pm 0.10)] ($P<0.05$); Compared with model group, the cell survival rate of the intervention group was significantly increased, and the apoptosis rate was significantly decreased. The expression of Sirt3 was significantly increased ($P<0.05$). Inhibition of Sirt3 reversed the effect of fluvastatin on proliferation inhibition and apoptosis of BMSCs induced by hydrogen peroxide.**Conclusion** Fluvastatin can inhibit the apoptosis of BMSCs induced by hydrogen peroxide, and its mechanism may be related to up-regulation of Sirt3.

Key words: Mesenchymal stem cells; Fluvastatin; Sirt3; Hydrogen peroxide; Bone marrow mesenchymal stem cells; Proliferation; Apoptosis

骨髓间充质干细胞(bone marrow mesenchymal stem cells, BMSCs)是存在于骨髓中的多能干细胞,