中国病理生理杂志 2009 25 (10): 1873-1877 ISSN: 1000-4718 CN: 44-1187/R

论著

内皮细胞Jagged1下调促进PDGF诱导的大鼠平滑肌细胞增殖迁移

武晓静[1],黄岚[1],周骐[1],陈剑飞[1],周音频[1],钮芹[1],邹云增[2],葛均波[2]
1第三军医大学附属新桥医院全军心血管病研究所, 重庆 400037;
2复旦大学附属中山医院上海市心血管病研究所, 上海 200032

收稿日期 2008-11-13 修回日期 2009-3-30 网络版发布日期 2010-3-2 接受日期 2009-3-30

摘要 目的: 探讨内皮细胞Jagged1表达对PDGF诱导的大鼠血管平滑肌细胞增殖迁移的调节作用。方法: 分离培养大鼠主动脉内皮和平滑肌细胞，将内皮接种于下室、平滑肌接种于上室建立细胞共培养体系，根据内皮是否行Jagged1小RNA干扰分为对照组、空载体组和Jagged1小RNA干扰组。用Western blotting检测内皮细胞Jagged1的干扰效率。于下室加入PDGF（10 μg/L）干预24 h后分别用［3H］-TdR 掺入和平滑肌迁移计数检测平滑肌细胞增殖迁移能力，用Western blotting检测平滑肌细胞α-SM-actin蛋白表达。结果: 与对照组相比空载体组内皮细胞Jagged1蛋白表达无明显差异，Jagged1小RNA干扰组内皮细胞Jagged1蛋白吸光度相对值明显降低（0.26±0.02 vs 0.67±0.02, P<0.05）；PDGF+空载体组平滑肌［3H］-TdR 掺入量和迁移数与PDGF组相比无明显差异，PDGF+Jagged1小RNA干扰组平滑肌［3H］-TdR 掺入量和迁移数高于PDGF组{［3H］-TdR 掺入(23 074±2 702)counts·min-1·well-1 vs (16 442±1 803)counts·min-1·well-1,n=5，P<0.05；迁移(27±4)cells/field vs (15±3) cells/field, n=5，P<0.05}；PDGF+空载体组平滑肌α-SM-actin蛋白表达与PDGF组相比无明显差异，PDGF+Jagged1小RNA干扰组平滑肌α-SM-actin吸光度相对值低于PDGF组（0.25±0.06 vs 0.49±0.04, n=3，P<0.05）。结论: 内皮细胞Jagged1下调促进PDGF诱导的平滑肌细胞增殖迁移，提示血管内皮细胞Jagged1表达在维持平滑肌收缩表型、抑制平滑肌过度增殖迁移中起一定调控作用。

关键词 内皮细胞 平滑肌细胞 细胞增殖 细胞运动 Notch通路
分类号 R363

Jagged1 knocking down in endothelial cells accelerates PDGF induced proliferation and migration of vascular smooth muscle cells in rats

WU Xiao-jing[1], HUANG Lan[1], ZHOU Qi[1], CHEN Jian-fei[1], ZHOU Yin-pin[1], NIU Qin[1], ZOU Yun-zeng[2], GE Jun-bo[2]

1Cardiovascular Institute of Xinqiao Hospital, Third Military Medical University, Chongqing 400037, China; 2Shanghai Institute of Cardiovascular Diseases, Zhongshan Hospital Affiliated to Fudan University, Shanghai 200032, China. E-mail: xiaojingwu1992@yahoo.com.cn

Abstract

<FONT face=Verdana>AIM: To investigate the effect of Jagged1 expression in endothelial cells (EC) on platelet derived growth factor (PDGF) induced proliferation and migration of vascular smooth muscle cells (VSMC) in rat.METHODS: Rat aorta EC was inoculated in the lower chamber and VSMC were in the upper chamber of the cell coculture system. Three groups were divided: control, sicontrol and siJagged1. The EC Jagged1 protein expression was assayed by Western blotting to evaluate small RNA interfering (RNAi) efficiency. After the cells were cocultured with PDGF for 24 h, the proliferation and migration of VSMC were respectively evaluated by ［3H］-TdR incorporation and migrating cells counting. Protein expression of α-SM-actin in VSMC was assayed by Western blotting. RESULTS: The Jagged1 protein expression in EC was significantly lower in siJagged1 group than that in control group (0.26±0.02 vs 0.67±0.02, P<0.05), and no statistic significance was observed between control and sicontrol groups. The VSMC ［3H］-TdR incorporation and migration were higher in PDGF +siJagged1 group than those in PDGF group {［3H］-TdR incorporation (23 074±2 702) counts·min-1·well-1 vs (16 442±1 803) counts·min-1·well-1, n=5, P<0.05; migration (27±4) cells/field vs (15±3)cells/field, n=5, P<0.05}. The α-SM-actin protein in VSMC was lower in PDGF + siJagged1 group than that in PDGF group (0.25±0.06 vs 0.49±0.04, n=3,

P<0.05).CONCLUSION: Jagged1 knock down in rat EC accelerates PDGF induced proliferation and migration of VSMC. These results suggest that Jagged1 expression in EC plays an important role in maintaining VSMC contract phenotype and inhibiting VSMC overgrowth after arterial injury.</FONT>

Key words Endothelial cells Smooth muscle cells Cell proliferation Cell movement Notch pathway

DOI: 1000-4718

通讯作者 武晓静 xiaojingwu1992@yahoo.com.cn