

论著

切应力和TNF- α 调节人血管内皮细胞质膜微囊蛋白的表达

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摘要 目的: 质膜微囊蛋白(caveolin)是细胞质膜微囊的主要结构蛋白, 研究显示caveolin可与多种信号分子相互作用, 在细胞信号转导和多种疾病的发生中有重要意义。本研究观察切应力和肿瘤坏死因子 α (TNF- α) 对人主动脉内皮细胞(HAECs) caveolin-1表达的调节作用。方法: 使用培养的3-5代HAECs细胞, 采用平行板流动室, 产生切应力为1.0 Pa的稳定流动环境。内皮细胞经切应力和TNF- α 刺激不同时间后, 采用Western blot和RT-PCR测定caveolin-1蛋白和mRNA表达的变化。结果: 1.0 Pa切应力作用24 h可明显引起caveolin-1蛋白和mRNA表达的下调, 尤其是mRNA表达的下调($P<0.05$)。1 h和4 h的切应力刺激可以引起caveolin-1 mRNA表达的明显下调($P<0.05$), 但4 h时caveolin-1蛋白表达尚没有明显下降。24 h TNF- α 刺激可以引起caveolin-1蛋白和mRNA表达的明显下调($P<0.05$)。结论: 切应力和TNF- α 可以抑制caveolin-1 mRNA和蛋白表达, 这种改变可能会影响动脉粥样硬化斑块的形成。

关键词 [内皮细胞](#); [质膜微囊蛋白1](#); [切应力](#); [肿瘤坏死因子](#); [动脉粥样硬化](#)

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Caveolin-1 expression is downregulated by shear stress and TNF- α in human aortic endothelial cells

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Abstract

AIM: To observe effects of shear stress and TNF- α on caveolin-1 expression. METHODS: Cultured human aortic endothelial cells (HAECs) of passage 3-5 were used in the experiment. Cells were exposed to a laminar flow (shear stress 1.0 Pa) by using a parallel rectangular flow chamber for different time. Caveolin-1 mRNA and protein expression were measured by RT-PCR and Western blot, respectively. Caveolin-1 expression of the cells stimulated by TNF- α were also studied to elucidate the influence of this inflammatory factor. RESULTS: After 24 h of exposure to 1.0 Pa shear stress, both of caveolin-1 protein and mRNA expression decreased in HAECs, especially caveolin-1 mRNA expression ($P<0.05$). No significant decrease in caveolin-1 protein expression was found after 4 h exposure to the shear flow, although there was a decrease in caveolin-1 mRNA expression ($P<0.05$). TNF- α induced decreases in caveolin-1 protein and mRNA expression in the cells stimulated for 24 h ($P<0.05$). CONCLUSION: Laminar flow of 1.0 Pa and TNF- α induce decreases in caveolin-1 protein and mRNA expression, which could play an important role in atherogenesis.

Key words [Endothelial cells](#) [Caveolin 1](#) [Shear stress](#) [TNF](#) [Atherosclerosis](#)

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