

论著

## 睾酮对血管内皮细胞纤溶活性影响及机制

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**摘要** 目的: 观察睾酮对血管内皮细胞分泌纤溶酶原激活物(tPA)、纤溶酶原激活物抑制物1(PAI-1)的影响及其机制。方法: 将体外培养的人血管内皮细胞(HUVEC)分为5个浓度睾酮组及单纯培养基对照组, MTT实验观察睾酮对细胞生长及活性影响。ELISA法测各组tPA、PAI-1含量。用雄激素受体拮抗剂(flutamide)预处理细胞后重复实验。结果: 生理及略低于生理剂量睾酮( $3 \times 10^{-10}$  mol/L- $3 \times 10^{-8}$  mol/L)可明显促进tPA分泌( $P < 0.01$ ); 而大剂量则使tPA含量明显减少( $P < 0.01$ )。各睾酮组PAI-1含量均明显低于对照组( $P < 0.05$ )。Flutamide能有效消除睾酮的上述作用。结论: 生理浓度睾酮通过雄激素受体促进tPA分泌, 降低PAI-1浓度而增强纤溶系统活性, 有利于防止血栓性疾病的发生。

**关键词** 睾酮; 组织型纤溶酶原激活物; 纤溶酶原激活物抑制物1; 内皮细胞; 受体,雄激素

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## Effects of testosterone on the fibrinolysis activity of HUVEC and its mechanism

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### Abstract

<FONT face=Verdana>AIM: To investigate the effect of testosterone with varied concentrations on the fibrinolysis activity of HUVEC and its mechanism. METHODS: Human umbilical vein endothelial cells (HUVEC) were cultured as recommended. After confluence, the cultures were treated with testosterone ( $3 \times 10^{-10}$ ,  $3 \times 10^{-9}$ ,  $3 \times 10^{-8}$ ,  $3 \times 10^{-6}$ ,  $3 \times 10^{-5}$  mol/L), and the control confluent cells were cultured in the same medium without steroid. MTT experiment was repeated for 72 hours to investigate each groups' cell proliferation. The tPA and PAI-1 antigen levels were assayed with ELISA Kits. Then with HUVEC incubated in androgen receptor antagonist (flutamide) 3 hours previously, the experiment was repeated. RESULTS: Testosterone at physiologic or lower concentrations ( $3 \times 10^{-10}$  to  $3 \times 10^{-8}$  mol/L) stimulated the secretion of tPA by HUVEC ( $P < 0.01$ ). However, tPA levels markedly reduced at larger doses ( $3 \times 10^{-6}$  to  $3 \times 10^{-5}$  mol/L). On the other hand, PAI-1 antigen levels decreased significantly at the testosterone concentrations ranging from  $3 \times 10^{-10}$  to  $3 \times 10^{-5}$  mol/L ( $P < 0.05$ ). Flutamide attenuated the testosterone's effects ( $P < 0.05$ ). CONCLUSIONS: The results indicated that testosterone at physiologically relevant concentrations decreased PAI-1, while increased tPA levels via the androgen receptor, which suggested that testosterone may have beneficial effects on preventing thrombotic diseases. </FONT>

**Key words** [Testosterone](#) [Tissue plasminogen activator](#) [Plasminogen activator inhibitor 1](#) [Endothelial cells](#) [Receptors](#) [androgen](#)

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