

基础研究

雌孕激素对ALI大鼠II型肺泡上皮细胞ENaC表达的影响

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摘要:

目的: 研究雌孕激素对急性肺损伤(ALI)大鼠II型肺泡上皮细胞钠通道(ENaC)表达的影响, 探讨雌孕激素促进肺泡内液体清除的机制。方法: 雌性未成年SD大鼠40只, 随机分为正常对照组、ALI模型组、雌孕激素联合治疗A组和雌孕激素联合治疗B组, 正常对照组颈静脉注入生理盐水(8 mL/kg-1), 后3组经颈静脉注入油酸(0.1 mL/kg-1)建立ALI模型, 其中雌孕激素联合A、B组分别在油酸注入前12和36 h皮下注射不同比例的雌孕激素混合液0.1 mL(A组 1:1 000, B组 1:200)。建模后6 h处死大鼠, 测定肺湿重/干重比值, 计算肺系数, 观察肺组织病理改变, 测定肺组织匀浆中α-ENaC、β-ENaC和γ-ENaC mRNA及蛋白的表达水平。结果: ①与正常对照组比较,ALI模型组肺湿重/干重比值及肺系数增加, 差异有统计学意义(P<0.01); 与ALI模型组比较,雌孕激素联合治疗组肺湿重/干重比值及肺系数下降, 以A组明显, 差异有统计学意义(P<0.05)。②ALI模型组大鼠出现明显肺水肿、出血及炎性细胞浸润; 与模型组比较, 联合治疗组大鼠肺水肿、出血及炎性细胞浸润较轻, A组稍明显。③与正常对照组比较, ALI组α-ENaC和γ-ENaC mRNA及蛋白表达水平明显降低, 差异有统计学意义(P<0.01); 与ALI模型组比较, 联合治疗组α-ENaC和γ-ENaC mRNA及蛋白表达水平有增加, 以A组增加明显, 差异有统计学意义(P<0.05)。结论: 雌孕激素可以通过增加ALI大鼠II型肺泡上皮细胞α-ENaC和γ-ENaC mRNA及蛋白的表达水平, 促进肺泡内液体的清除。

关键词: 雌激素; 孕激素; 钠通道; 急性肺损伤; 急性呼吸窘迫综合征

Influence of estradiol and progesterone in type II alveolar ENaC in rats with acute lung injury

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Abstract:

Abstract: Objective

To study the influence of 17β-estradiol and progesterone in type II alveolar epithelial Na+ channel (ENaC) in rats with acute lung injury(ALI) and explore the mechanism of estradiol and progesterone in promoting the clearance of alveolar fluid.Methods 40 immature female SD rats were randomly assigned into 4 groups: normal control group(injected with 8 mL/kg-1 saline via venous),ALI model group,17β-estradiol and progesterone combination A and B group.The rats in last three group were injected with 0.1 mL/kg-1 oleic acid via venous to establish ALI model.The rats in combination A and B groups were injected subcutaneously with 17β-estradiol and progesterone mixed liquor 0.1 mL in different ratios (A group 1:1 000, B group 1:200) at 12 and 36 h before oleic acid injection.All the rats were sacrificed at 6 h after oleic acid injection.The wet/dry ratio and the lung coefficient were determined, the pathological changes of lung tissues were observed, and the expressions of α-ENaC,β-ENaC and γ-ENaC mRNA and protein were determined.Results ① Compared with normal control groups, the wet/dry ratio and the lung coefficient in ALI model group were increased significantly (P<0.01); in combination A and B groups, the wet/dry ratios and the lung coefficients were decreased compared with model group, especially in A group (P<0.05).② Obvious pulmonary edema,bleeding and inflammatory cell infiltration were observed in ALI group.However, the extent of pulmonary edema,bleeding and inflammatory cell infiltration were decreased markedly in combination A and B groups, especially in A groups.③ Compared with normal control group,the expressions of α-ENaC and γ-ENaC mRNA and protein were decreased in ALI model group(P<0.01); compared with ALI group,they were increased significantly in combination A and B groups,especially in A group(P<0.05).Conclusion 17β-estradiol and progesterone can increase the expressions of type II alveolar epithelial α-ENaC and γ-ENaC mRNA and protein in rats with ALI,and promote the clearance of alveolar fluid.

Keywords: estrogen; progesterone; sodium channel; acute lung injury; acute respiratory distress syndrome

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