

论文

丁基苯酞对线粒体呼吸链复合酶活性的影响

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摘要:

目的: 阐明正丁基苯酞(*dl*-3-*n*-butylphthalide, *dl*-NBP)改善缺血脑能量代谢的机制。方法: 用分光光度法测定局灶性脑缺血大鼠脑线粒体呼吸链复合酶I,II,III和IV活性的改变, 并观察*dl*-NBP对这些变化的影响。结果: 缺血时复合酶II活性升高, IV的活性显著降低; 再灌后, 复合酶I活性升高, II的活性降低。在缺血前10 min给予*dl*-NBP (5 mg.kg⁻¹或10 mg.kg⁻¹, ip)能逆转缺血-再灌引起的上述复合酶活性改变, 尤其是使缺血后急剧降低的复合酶IV活性得到明显提高。同时NBP(*d*-,*l*-,*dl*-)还能逆转低糖低氧造成的原代培养大鼠皮质细胞呼吸链复合酶IV活性降低。结论: NBP能够改善缺血脑内能量状态是直接作用于脑线粒体的结果, 而*d*-NBP起着主要作用。

关键词: 正丁基苯酞 局灶性脑缺血 呼吸链复合酶 培养神经细胞

EFFECTS OF BUTYLPHTHALIDE ON THE ACTIVITIES OF COMPLEXES OF THE MITOCHONDRIAL RESPIRATORY CHAIN

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Abstract:

AIM: To study the effect of *dl*-3-*n*-butylphthalide(*dl*-NBP) on the function of mitochondrial respiratory chain and to elucidate the increasing effect of NBP on brain energy supply during cerebral ischemia. METHODS: Mitochondria were isolated from the brain of transient middle cerebral artery occluded (MCAO) rat and the activities of the four complexes of the respiratory chain were determined. RESULTS: The activity of complex IV was deeply decreased after 1 h-ischemia. It was back to normal level when treated with NBP (5 mg.kg⁻¹ or 10 mg.kg⁻¹ ip 10 min before ischemia). During the reperfusion period after ischemia, the activity of complex I was notably increased at 3 h, and that of complex II was decreased at 6 h. With NBP treatment, these altered activities also returned to normal level. In cultured neurons subjected to 6 h-hypoxia/hypoglycemia, the same increasing effect of NBP(*d*-,*l*- or *dl*-) on the activity of complex IV was also found, and *d*-NBP seemed to be more effective. CONCLUSION: NBP can act directly on complex IV to increase its activity. This action may play an important role in the increasing effect of NBP on brain energy supply during cerebral ischemia.

Keywords: middle cerebral artery occlusion(MCAO) complexes of respiratory chain cultured neurons *d*-,*l*-,*dl*-butylphthaline

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