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论著

丙烯酰胺抑制大鼠肌注A型肉毒毒素后的神经芽生

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摘要 目的 观察丙烯酰胺是否能抑制肉毒毒素肌注后的神经芽生，以延长其治疗肌肉过强活动疾病的疗效。方法 SD大鼠随机分为肉正常对照组、丙烯酰胺组、肉毒毒素组和毒毒素＋丙烯酰胺组。每只大鼠右肢腓肠肌分别肌肉注射A型肉毒毒素5 U或生理盐水1次（0.2 mL），肌注后d 3, 6, 9, 12, 15, 18及21分别ip 3%丙烯酰胺或生理盐水，每次0.1 mL。肌肉注射肉毒毒素后1, 2, 3, 4, 6, 8, 10及12周的8个时间点评定大鼠右后肢肌力，观察单纤维肌电图和形态学计数神经纤维。结果 肉毒毒素组右后肢肌力下降，单纤维肌电图纤维密度测定和病理形态神经纤维计数结果均显示A型肉毒毒素肌肉注射后神经芽生现象；单纤维肌电图动作电位平均连续差结果提示出现神经肌肉接头传导异常，12周可基本恢复正常。加用丙烯酰胺可延缓芽生高峰的时间和抑制芽生程度，并延缓神经肌肉接头功能的恢复。结论 应用丙烯酰胺可抑制A型肉毒毒素局部注射后神经芽生，延迟肌力恢复。

关键词 肉毒杆菌毒素, A型 丙烯酰胺 神经芽生 肌电描记术 神经纤维 神经肌肉接头

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Acrylamide inhibits terminal sprouting triggered by botulinum toxin type A in rats

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Abstract

AIM To evaluate if acrylamide can inhibit nerve terminal sprouting to prolong the muscle relaxation effect of botulinum toxin type A (BTXA). **METHODS** SD rats were divided randomly into normal, acrylamide, BTXA and BTXA+acrylamide groups. Right gastrocnemius of the rats was injected im BTXA 5 U in BTXA+acrylamide and BTXA groups and normal saline (NS, 0.2 mL) in acrylamide group. At d 3, 6, 9, 12, 15, 18 and 21 after injection of BTXA or NS, 3% acrylamide or NS (0.1 mL) was injected ip, respectively. At 1, 2, 3, 4, 6, 8, 10 and 12 weeks after im BTXA or NS, muscular power of right lower limb was scored by the method of Longa, et al, the fiber density and action potential mean consecutive difference of right gastrocnemius were examined by single fiber electromyogram, and the morphologic nerve fiber analysis was carried out. **RESULTS** After im BTXA, muscular power of right lower limb decreased; increased fiber density and morphologic nerve fiber analysis revealed terminal sprouting; and prolonged mean consecutive difference revealed abnormal function of neuromuscular junction; which almost recovered in 12 weeks after injection of BTXA. Acrylamide inhibited the nerve terminal sprouting number, postponed the peak time of nerve terminal sprouting, and delayed recovery of neuromuscular junction function. **CONCLUSION** Acrylamide inhibits both the terminal sprouting and the functional recovery of neuromuscular junction.

Key words botulinum toxin type A acryla-mide nerve terminal sprouting electromyography nerve fibers neuromuscular junction

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