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论文

鞘内注射VEGF对大鼠脊髓损伤后神经纤维和神经元的保护作用

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摘要：

目的 探讨脊髓损伤后鞘内重复注射血管内皮生长因子（VEGF)对神经元和轴突的保护作用。方法 将45只实验动物随机分为3组， VEGF组脊髓损伤后每天2次鞘内注射25ng VEGF，连用1周。每周进行后肢BBB评分，8周后评价脊髓损伤的修复情况和VEGF的神经保护作用。结果 手术后VEGF组动物后肢运动功能的恢复优于模型组，在后4周更为明显。VEGF组脊髓腹侧的神经纤维和神经元形态较好，损伤较轻，每高倍视野中血管数目明显多于模型组（P<0.001），caspase 3阳性细胞数少于模型组（P<0.001）。超微结构观察可见，VEGF组的神经纤维和神经元受损较轻，次级溶酶体的数量也明显少于模型组。结论 VEGF对大鼠脊髓损伤引起的神经纤维和神经元的变性有保护作用并可恢复损伤神经的部分功能。

关键词： 鞘内注射；血管内皮生长因子；脊髓损伤；caspase-3；超微结构

Protective effect of intrathecal administration of VEGF on nerve fibers and neurons after spinal cord injury in rats

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Abstract:

Objective To investigate the effect of intrathecal administration of vascular endothelial growth factor (VEGF) on repair of spinal cord injury（SCI）, and explore neuroprotection of VEGF on neurons and nerve fibers. Methods 45 animals were randomly divided into three groups. VEGF was intrathecally administrated at a dose of 25ng twice a day for a week in the VEGF group after SCI. The Basso, Beattie and Bresnahan locomotor rating scale (BBB) was observed each week. 8 weeks later, histological changes were examined by hematoxyhn and eosin (HE), immunohistochemical staining and an electron microscope. Results The BBB scale in the VEGF group was higher than that in the model group, especially at the last 4 weeks. Histology revealed that the morphology of fibers and neurons at the ventral of the spinal cord in the VEGF group was better than those in the model group. More vessels were observed in animals administrated with VEGF compared with the model group(P<0.001）. The number of caspsase-3-positive cells in the VEGF group was smaller（P<0.001）. Slightly damaged nerve fibers and neurons were found in the VEGF group, with fewer mitochondria with disrupted cristae and secondary lysosomes were fewer compared with the model group. Conclusions Administration of VEGF improves part of the functions of nerve fibers and provides neuroprotection for damaged neurons and fibers.

Keywords: Intrathecal administration; Vascular endothelial growth factor; Spinal cord injury; Caspase 3; Ultrastructure

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