

阿魏酸對於周邊神經損傷之研究

Ferulic acid enhances peripheral nerve regeneration across long gaps

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中文摘要

神經損傷為現今社會眾多意外中的主角，因而使得神經再生的研究於近年來蓬勃發展。神經斷傷後，再生軸突與遠端斷端接合狀況，決定了日後神經功能恢復的程度。神經斷傷的間距影響了治療方式的選擇，針對長距離間距之損傷，神經導管接合術治療為主要治療方式。在神經管內添加促進神經再生的物質，能使管中再生的神經在較短的時間內，通過神經管之間隙而完成再生。此研究使用阿魏酸來修復斷傷之周邊神經，發現25 ug/ml濃度能顯著的促進雪旺氏細胞的生長，而在動物實驗中亦能明顯的增加再生軸突的數量與密度，與對照組相比，可加速運動神經傳導速度（NCV）及誘發的肌肉動作電位（MAP）阿魏酸的可以顯著減少神經遠端部分的巨噬細胞數量。綜上所述，阿魏酸是一個能修復周邊神經損傷的藥物。

關鍵詞：阿魏酸、周邊神經再生、神經導管、再生藥物

Abstract

This study investigated the effect of ferulic acid (FA) against peripheral nerve injury *in vitro* and *in vivo*. In the *in vitro* test, the effect of FA on viability of Schwann cells was studied. In the *in vivo* test, right sciatic nerves of the rats were transected, and a 15 mm nerve defect was created. A nerve conduit made of silicone rubber tube filled with FA (5 and 25 $\mu\text{g/ml}$), or saline (control), was implanted into the nerve defect, and their nerve regenerative abilities were evaluated. Results show that the number of proliferating Schwann cells increased significantly in the FA-treated group at 25 $\mu\text{g/ml}$ compared to that in the control group. After 8 weeks of nerve transaction, the FA-treated group at 25 $\mu\text{g/ml}$ had a higher rate of successful regeneration across the wide gap, a significantly calcitonin gene-related peptide (CGRP) staining of the lamina I-II regions in the dorsal horn ipsilateral to the injury, and a significantly shortening of the latency and an acceleration of the nerve conductive velocity (NCV) of the evoked muscle action potentials (MAPs) compared with the controls. We also found the FA could significantly diminish the number of macrophages recruited in the distal portions of the transected sciatic nerves, which may explain its nerve growth-promoting capacity in this critically-sized nerve gap model. In summary, the FA may be useful in the development of future strategies for the treatment of peripheral nerve injury.

Keywords: Peripheral nerve regeneration; Ferulic acid; Silicone rubber conduit