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Neuroprotective effects of folic acid on experimental diabetic peripheral neuropathy.

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Abstract

Diabetic peripheral neuropathy (DPN) is widely considered as a degenerative complication of diabetic patients. The clinical effectiveness of folic acid (FA) on DPN is uncertain. The objective of the present study was to determine the effect of FA in DPN using electromyography (EMG), histopathological examination, immunohistochemistry, inclined plane test, and malondialdehyde (MDA) levels as a marker for lipid peroxidation in experimental diabetic rats. A total of 21 Sprague Dawley rats were randomly divided into 3 groups: control group, diabetes group, and FA-treated group. In EMG, compound muscle action potential (CMAP) amplitude in the sciatic nerve was lower in the diabetes group compared with the control group. CMAP amplitude in the sciatic nerve was higher in the FA-treated group when compared with the diabetes group. Distal latency and CMAP duration in the sciatic nerve were lower in the FA-treated group when compared with the diabetes group. In histopathological examination of the sciatic nerve, peripheral fibrosis was present in the diabetic group; the fibrosis was lower in the FA-treated group. In comparison with the diabetes group, the expression of nerve growth factor (NGF) was higher in the FA-treated group. The scores for the inclined plane test were lower in the diabetes group and higher in the FA-treated group than the control group. The MDA levels were significantly lower in the FA-treated group when compared with the diabetes group.The study suggests that FA can protect diabetic rats against DPN and that the underlying mechanism for this may be related to improvement of the expression of NGF and lower MDA levels.

KEYWORDS: Diabetic peripheral neuropathy; EMG; MDA; NGF expression; histopathology; inclined plane

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