

[Effect of deep electroacupuncture stimulation of "Huantiao" (GB 30) on changes of function and nerve growth factor expression of the injured sciatic nerve in rats].

[Article in Chinese]

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Abstract

OBJECTIVE; To observe the effect of deep electroacupuncture (EA) stimulation of "Huantiao"(GB 30) on the functional and pathological changes and nerve growth factor (NGF) expression of the damaged sciatic nerve in rats, so as to study its mechanisms underlying relieving sciatica.

METHODS:

Forty-eight SD rats were randomly divided into normal, model, deep EA and shallow EA groups (n = 12 in each group). The sciatic nerve injury model was established by mechanical clamp of the sciatic nerve stem. For deep and shallow EA, the acupuncture needles were inserted into GB 30 about 16 mm and 7 mm, respectively. The EA treatment was given 20 min, once daily for 14 days. The evoked potentials of the injured sciatic nerve stem responding to electrical stimulation were recorded by using a biophysiological experimental system for calculating the motor conduction velocity. Pathological changes of the sciatic nerve were displayed by H. E. stain. The expression of NGF and Fos proteins was detected by immunohistochemistry.

RESULTS:

In comparison with the normal group, the conduction velocity and the amplitude of the evoked potentials of the sciatic nerve were significantly decreased in the model group ($P < 0.05$). Following EA, both conduction velocity and amplitude of the evoked potentials in the deep EA group, and the conduction velocity in the shallow EA group were considerably increased ($P < 0.05$). The therapeutic effects were significantly better in the deep EA group than that in the shallow EA group ($P < 0.05$). No significant differences were found between the shallow EA and model groups in the amplitude of evoked potentials ($P > 0.05$), and no significant changes of latencies of the evoked potentials in the four groups ($P > 0.05$). In the model group, the disorganized nerve fibers axons, myelin and Schwann cells of the damaged sciatic nerve were found, which became milder in the EA groups particularly in the deep EA group. In regard to the NGF and Fos immunoactivity of the injured sciatic nerve, the expression levels of both NGF and Fos proteins were obviously higher in the model group than in the normal group ($P < 0.05$). After EA stimulation, NGF expression was further significantly up-regulated in both deep and shallow EA groups ($P < 0.05$), and Fos protein expression was notably down-regulated in the deep and shallow EA groups ($P < 0.05$). The expression of NGF was significantly higher and Fos protein was obviously lower in the deep EA group than in the shallow EA group ($P < 0.05$).

CONCLUSION:

Deep EA stimulation of GB 30 can improve the pathological changes and function of the injured sciatic nerve in the rat, which is closely associated with its effects in up-regulating NGF expression and down-regulating Fos expression. The deep EA is relatively better in the therapeutic effect. These facts may be one of the mechanisms of EA in relieving sciatica in clinic practice.

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