

# Nerve growth factor and mitogen activated protein kinases alterations in rat's sensory neurons after experimental early type 1 Diabetes: effects of electroacupuncture

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Diabetic polyneuropathy (DPN), characterized by early hyperalgesia and increased nerve growth factor (NGF) availability, evolves in late irreversible neuropathic symptoms with reduced NGF support to sensory neurons. Electroacupuncture (EA) modulates NGF presence and activity in the peripheral nervous system, being effective for the treatment of DPN symptoms. Our working hypotheses are that NGF plays an important pathogenic role in DPN development while EA could be useful in the therapy of DPN by modulating NGF expression and activity.

Diabetes was induced in rats by streptozotocin (STZ) injection. One week after STZ, EA treatments were started and continued for three weeks. NGF system and hyperalgesia-related mediators were analyzed in the dorsal root ganglia (DRG), and in their spinal and skin innervation territories. Four weeks diabetes increased NGF and NGF receptors and deregulated intracellular signaling mediators of DRG neurons hyper-sensitizations. EA in diabetic rats decreased both NGF and NGF receptors, normalized c-Jun N-terminal and p38 kinases activation, decreased transient receptor potential vanilloid-1 ion channel and possibly activated Nf- $\kappa$ B. Increase of NGF signaling might play an important role in the development of DPN. EA represent a supportive tools aimed at controlling DPN by modulating NGF signaling in diabetes-targeted neurons.

## References

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