

Effect of tensile load on ERK 1/2 and p38 signaling pathways in rat subcutaneous fascia

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BACKGROUND Despite accumulating evidence of the clinical effectiveness of acupuncture, its mechanism remains largely unclear. To investigate the effects of acupuncture tensile load on expressions of extracellular signal-regulated kinase (ERK1/2) and p38 in subcutaneous fascia, and explore the molecular biological reactivity of subcutaneous fascia overlapping the meridian and non-meridian lines.

METHODS Twenty Sprague-Dawley rats were randomly divided into 4 groups (A, B, C and D). The rats in group A (control) received no treatment. The rats in the other 3 groups respectively received manual twisting at acupoint ST36 (B), electro- twisting at acupoint ST36 (C), and manual twisting at a non-acupoint (inguinal fat pad) (D). Ten days after the treatments, collected the fascial and muscular tissues at the acupuncture sites to evaluate the expression of ERK1/2, p-ERK1/2, p38 and p-p38.

RESULTS IHC staining and Western blotting revealed significantly increased expressions of ERK1/2, p-ERK1/2 and p-p38 in the all acupuncture groups, and the strongest expression intensity was in group D and the least in group B. Acupuncture results in up-regulation of ERK1/2 and p38 in the subcutaneous fascia. Subcutaneous fasciae in different regions show variations in the intensity of reactivity to mechanical or electrical needling stimulation.

CONCLUSIONS This research indicates that needling manipulation of the fascia evokes a local, extracellular matrix-initiated response, besides the common neurohormonal regulating effect of acupuncture. It's a better understanding of how interventions involving mechanical stretch could provide maximal therapeutic benefit.