PURPOSE To investigate the effect of mechanical tensile load on Type-1 procollagen, Type-3 procollagen, connective tissue growth factor (CTGF) and transforming growth factor-β1 (TGF-β1) expressions in rat subcutaneous fascia.

METHODS Thirty male Sprague–Dawley rats were randomized into control group (A), insertion without rotation group (B) and acupuncture with rotation group (C). The rats in group B and C were subjected to mechanical tensile stimulation on the midpoint of the inguinal groove with an acupuncture needle, which was repeated twisting and insertion-extraction of the acupuncture needle (B). The subcutaneous tissue was sampled after 14 days of treatment, and the expression levels of Type-1 procollagen, Type-3 procollagen, CTGF and TGF-β1 mRNA were assessed using RT-PCR.

RESULTS Tensile stimulations resulted in significantly down-regulated expressions of the CTGF and TGF-β1 genes, but there were no significant differences between the twisting group and insertion-extraction group. Tensile microinjury resulted in no significant difference in Type-1 procollagen and Type-3 procollagen levels among the three groups (Figure).

CONCLUSIONS Fascia was involved in the response to tensile load, which enhance cell proliferation and cause changes in the CTGF and TGF-β1 gene transcription. These results have potential relevance to the mechanisms of treatments applying brief mechanical stretch to tissues.