Neuroimaging the response to acupuncture at LI-4 (Hegu): Implications for research and clinical practice.

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Aims: Our primary aim was to investigate the extent of activation and deactivation of the brain in response to both deep and superficial needling at the acupuncture point Hegu (LI-4) on the hand. Our secondary aim was to explore possible variations in brain images associated with other factors, including the *deqi* sensation (commonly a dull ache) and the participant's gender.

Study design: Participant-blinded randomised controlled cross-over trial.

Setting: York Neuroimaging Centre, University of York, UK.

Participants: Seventeen healthy right-handed volunteers, naïve to acupuncture.

Experimental paradigm: Volunteers received two interventions, superficial and deep needling at Hegu (LI-4), from an experienced acupuncturist. Scans were conducted over two 16 minute periods according to a randomised block design. Needle sensations were rated by each participant after each scan.

Imaging: Scanning was performed with a 3 Tesla GE magnetic resonance imaging system. Analysis was with FSL software based on generalised linear modeling.

Results: Data will be presented that compares superficial and deep needling and identifies regions of the brain where activations and deactivations of blood flow takes place. Differential responses in the brain to *deqi* sensations and gender will be explored. Unexpected and significant variations between men and women were found. The implications for clinical practice will be discussed.

Conclusion: The depth of needling and the sensation elicited when needling are dimensions of acupuncture that have a profound impact on brain responses. There are immediate implications for research and, in the longer term, neuroimaging studies have the potential to impact on clinical practice.

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