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## Does acupuncture alter pain-related functional connectivity of the central nervous system? A systematic review

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**Background & Aim:** One of the proposed mechanisms behind acupuncture analgesia is normalising the pain-related functional connectivity (FC) of the central nervous system. Several studies have investigated the effect of acupuncture on FC changes. However, to date, there is no conclusive evidence on the ability of acupuncture intervention on pain-related FC. Therefore, the aim of the systematic review was to evaluate the evidence for the effectiveness of acupuncture on influencing the FC of the CNS in patients with musculoskeletal pain.

**Methods:** To identify the relevant studies, a systematic literature search was conducted in the following databases: AMED, CINAHL, EMBASE, MEDLINE, PEDro, PubMed, Scopus, and Web of Science using relevant MeSH. Two independent reviewers have conducted article screening process, methodological quality assessment of the included studies (Downs and Black questionnaire) and level of completeness and transparency in reporting acupuncture interventions with STRICTA.

**Results & Conclusion:** Seven studies met the inclusion criteria, out of which, 3 were RCTs and 4 were non-RCTs. Included participants (n=191) were presented with a range of clinical conditions (osteoarthritis, chronic low back pain, carpal tunnel syndrome, and fibromyalgia). Methodological quality of the studies were high in 6 studies and moderate in 1 study. Information on depth of needle insertion, needle retention time, and needle type were not reported. Due to heterogeneity in FC measures, the meta-analysis was not conducted. Positive alterations on FC of the CNS were consistently observed following long-term acupuncture intervention in patients with musculoskeletal pain. This review provides a preliminary evidence on the effectiveness of acupuncture on FC in patients with musculoskeletal pain.

## The influence of Shenshu acupoints on experimental acupuncture

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**Background:** Shenshu acupoints in acupuncture effect as same as internal organ soma theory. However, the influence of Shenshu acupoints on experiment is needed to know.

**Objectives:** To examine the influenced skin regions of Shenshu acupoints on human body.

**Method:** Basic study and experimental analysis was done on pain threshold at examined points of whole body's dermatomes before and after using anesthesia acupuncture at Shenshu acupoints. 31 healthy volunteers used electronic stimulus parameter with two phases of symmetric thorn pulse, 160 Hz for 20 minutes, cathode on the left acupoint and anode on the right acupoint. Data analysis was done with SPSS16.0 software.

**Results:** Pain threshold was increased symmetrically from dermatome T6 to dermatome S1 on two sides of dorsal body. The highest was at dermatome L2 (p=0.000), the edge ones were dermatome T6 and dermatome S1 (p<0.05). The diastolic blood pressure was increased significantly (p=0.003). This study is a safe procedure and has no side effects.

**Conclusion:** The influenced regions of anesthesia acupuncture at Shenshu acupoints are dermatomes from T6 to S1 and symmetrically on two sides of dorsal body.