Interventions for Sensory Impairment in the Upper Limb After Stroke

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Sensory impairments significantly limit functional use and safety of the upper limb in people after stroke. This systematic review aimed to determine the effectiveness of interventions directed at improving sensory impairments of the upper limb after stroke.

Search Strategy
We searched the Cochrane Stroke Group Trials Register (last searched October 8, 2009), the Cochrane Central Register of Controlled Trials (CENTRAL; The Cochrane Library 2009, Issue 1), MEDLINE (1966 to January 2009), EMBASE (1980 to January 2009), and 6 further electronic databases to January 2009. We also hand-searched relevant journals, contacted authors in the field, searched doctoral dissertation databases, checked reference lists, and completed citation tracking.

Selection Criteria
Randomized controlled trials and controlled trials comparing interventions for sensory impairment after stroke with no treatment, conventional treatment, attention placebo, or with other interventions for sensory impairment.

Data Collection and Analysis
Two review authors selected studies, assessed quality, and extracted data. We analyzed study data using mean differences and odds ratios as appropriate. The primary outcome we considered was sensory function and secondary outcomes included upper limb function, activities of daily living, impact of stroke, and quality of life as well as adverse events.

Main Results
We included 13 studies, with a total 467 participants, testing a range of different interventions. Outcome measures included 36 measures of sensory impairment and 13 measures of upper limb function. All but 2 studies had unclear or high risk of bias. Although there is insufficient evidence to reach conclusions about the effects of interventions included in this review, 3 studies provided preliminary evidence for the effects of some specific interventions, including mirror therapy for improving detection of light touch, pressure, and temperature pain; a thermal stimulation intervention for improving rate of recovery of sensation; and intermittent pneumatic compression intervention for improving tactile and kinesthetic sensation. We could not perform meta-analysis due to a high degree of clinical heterogeneity in both interventions and outcomes.

Authors’ Conclusions
Multiple interventions for upper limb sensory impairment after stroke are described but there is insufficient evidence to support or refute their effectiveness in improving sensory impairment, upper limb function, or participants’ functional status and participation.

Applicability of Findings to Clinical Practice
Several techniques show promise for addressing sensory impairments in the upper limb after stroke, but there are inadequate high-quality trials to be able to make recommendations that support or refute the use of specific interventions. Clinicians should be conscious of monitoring adverse effects, because few studies recorded them.

Future Research
Further high-quality, better reported studies are needed not only to address interventions and methodological limitations identified in this review, but also interventions identified in the search process and commonly used in the clinical setting to evaluate their effectiveness.

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