Meta-analysis examining the effectiveness of electrical stimulation in improving functional use of the upper limb in stroke patients
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CRD summary
The review assessed the effectiveness of electrical stimulation for the treatment of upper extremity impairments in stroke patients. The authors concluded that the use of electrical stimulation can produce a positive effect in patient recovery. Clinical diversity and poor reporting of the review process weaken confidence in this conclusion.

Authors' objectives
To determine the effectiveness of electrical stimulation for the treatment of upper extremity impairments in stroke patients.

Searching
MEDLINE and CINAHL were searched from 1996 to 2002; the search terms were reported.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) and quasi-randomised controlled trials were eligible.

Specific interventions included in the review
Studies assessing electrical stimulation applied to the upper extremity were eligible for inclusion. Both functional electrical stimulation and transcutaneous electrical nerve stimulation were eligible. Cardiac experiments were excluded from the review.

Participants included in the review
Participants with a primary diagnosis of cerebrovascular accident were eligible for inclusion, regardless of age, gender, previous cerebrovascular accidents or time since stroke.

Outcomes assessed in the review
Studies assessing change in shoulder subluxation, pain, upper extremity range of motion, and functional use of upper extremities were eligible for inclusion. Outcomes relating to hemiplegic lower limb extremities were excluded from the review.

How were decisions on the relevance of primary studies made?
The authors did not state how articles were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

For each study, effect sizes were calculated for the reported outcomes.

Methods of synthesis
How were the studies combined?
A weighted average effect size with 95% confidence interval (CI) was calculated for overall recovery, based on eight effect sizes related to shoulder subluxation, pain, upper extremity range of motion, and functional use of upper extremities. The effect sizes were weighted by sample size.

How were differences between studies investigated?
Differences between the studies were not formally assessed.

Results of the review
Five trials (n=229) were included in the review; it was unclear how many were RCTs.

A small but statistically significant effect of electrical stimulation was found on overall recovery of upper limbs in stroke patients (d=0.21, 95% CI: 0.04, 0.38). The individual study effect sizes ranged from 0.32 to 1.53.

Authors’ conclusions
Electrical stimulation produces a positive effect in patient recovery from stroke-related incidences.

CRD commentary
The research question was supported by clear inclusion and exclusion criteria. Two electronic databases were searched for relevant articles, but it is not known whether any language restrictions were applied. No attempt to identify unpublished material was reported and publication bias was not assessed. The authors did not report the methods used to evaluate retrieved studies for inclusion in the review or to extract data from the primary studies, therefore the possibility of the introduction of reviewer error or bias cannot be assessed. In addition, the methodological quality of the primary studies was not assessed.

The authors’ choice of a quantitative synthesis might not have been appropriate given the clinical variation between studies in terms of intervention regimen, participants and outcome. In addition, statistical homogeneity was not assessed and some studies contributed more than one effect size to the meta-analysis. Given these considerations and the small data set on which the review was based, the authors’ conclusion should be viewed with some caution.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that since there is limited research on the involvement of occupational therapists in the use of electrical stimulation for treating stroke patients, further research by occupational therapists is needed to determine the efficacy of occupational therapy interventions utilising electrical stimulation.

Bibliographic details

Indexing Status
Subject indexing assigned by CRD

MeSH
Electric Stimulation Therapy; Meta-Analysis; Occupational Therapy; Paresis /rehabilitation; Range of Motion, Articular; Stroke /rehabilitation

AccessionNumber
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.