Effects of conductive education intervention for children with a diagnosis of cerebral palsy:
an AACPDM evidence report
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CRD summary
This review addressed the effects of conductive education in children with cerebral palsy. The authors concluded that the quality of evidence was insufficient to determine whether conductive education is effective or not. Despite attempts to capture all study types, restricting studies to those published in English may have had a significant impact on the review's findings. The authors' conclusions are appropriately cautious.

Authors' objectives
To review the effects of conductive education (CE) in children diagnosed with cerebral palsy (CP).

Searching
The following electronic databases were searched using the term 'conductive education': MEDLINE (1966 to December 2001), HealthSTAR (1975 to December 2000), CINAHL (1982 to September 2001), EMBASE (1988 to September 2001), ERIC (1966 to October 2001), AMED (1985 to November 2001) and PsycINFO (1984 to October 2001). The bibliographies of studies and review articles were examined for additional studies. Only articles published in the English language were included.

Study selection

Study designs of evaluations included in the review
No inclusion criteria for the study design were specified. The majority of the included studies were cohort studies (controlled and uncontrolled) or case series.

Specific interventions included in the review
Studies where the intervention was labelled as CE were eligible for inclusion. CE was delivered by a variety of professionals in either residential or community education settings, and in one case in a children's hospital.

Participants included in the review
Studies evaluating children were eligible for inclusion. All included studies, except one, had samples where more than 90% of the children were diagnosed with CP; the remaining study comprised 75% children with CP. Where reported, the age of the children in the included studies ranged from 1 to 13 years.

Outcomes assessed in the review
No inclusion criteria for the outcome measures were specified. The studies included in the review used a variety of tests (described in the review) to measure outcome in terms of dimensions of disability. The majority of the data presented examined outcome in terms of two dimensions of disability:

functional limitation and activity (restriction of ability to perform activities); and

impairment (loss or abnormality of body structure or function).

Some data were reported for societal limitations and context factors (barriers to full participation imposed by societal attitudes, architectural barriers, social policies and other external factors).

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.
Assessment of study quality
The included studies were rated using the American Academy for Cerebral Palsy and Developmental Medicine (AACPDM) levels of evidence classification. This classification assesses internal validity of a study and comprises two parts, A and B. Part A uses a 5-point scale (from randomised controlled trial at level I to case series at level V) to rate study design. Part B uses a 7-point scale to assess the conduct of the study within the parameters of the study design used; a score of six or seven is classified as ‘strong’, five as moderate, and four or less as weak. The authors did not state who performed the validity assessment.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Data describing the CE programme, study population and outcome measured (including how it was measured and the dimension of disability to which it related) were extracted.

Methods of synthesis
How were the studies combined?
The results of individual studies were presented in tables detailing level of evidence and quality and the direction of the result (by data set or outcome measure). The direction of the result was classified as follows:

(a) both groups improved;
(b) CE group improved, no change in control group.;
(c) CE group improved, control group deteriorated;
(d) no change in CE group, control group improved;
(e) CE group deteriorated, control group improved;
(f) both groups deteriorated.

A narrative summary was presented, along with a summary table illustrating the direction of the result and the level of evidence by outcome; the outcomes were grouped by dimension of disability.

How were differences between studies investigated?
Differences between the studies were discussed in the text and recorded in results tables.

Results of the review
Fifteen studies with a total of 1,038 participants were included in the review: 1 controlled trial (partially randomised) (n=66), 3 cohort studies with concurrent control groups (n=79), 3 cohort studies with historical control groups (n=108) and 8 case series (n=785).

Outcome measures for impairment.
One study, which was rated as level IV and weak, reported results favouring CE without statistical evaluation. One study, which was rated as level II and weak, reported statistically significant results in favour of the control group. Four studies (25 data sets), which were rated as level I/strong to level III/weak, reported no statistically significant difference between the groups.

Outcome measures for functional limitation and activity.
Four studies (9 data sets), which were rated level I/strong to level II/weak, reported statistically significant results in favour of CE. Three studies (8 data sets), one rated level II/moderate and two rated level II/weak, reported statistically significant results in favour of the control group. Six studies (81 data sets), which were rated level I/strong to level II/weak.
III/weak, reported no statistically significant difference between the groups.

Outcome measures for societal limitations and contextual factors.

One study, which was rated level II/weak, reported statistically significant results in favour of CE. Four studies (8 data sets), which were rated level I/strong to level III/weak, reported no statistically significant difference between the groups.

Authors' conclusions
The literature did not provide conclusive evidence either in support of or against CE. The limited number of studies and their weak quality make purely evidence-based decision-making on CE impossible. Further research is required.

CRD commentary
The review did not clearly state the research question to be addressed. Broad inclusion criteria were used to capture all studies relating to the effects of CE. The search strategy was similarly broad. However, the restriction of included studies to those published in the English language might have resulted in the omission of some relevant data; this could be a particular problem given the national origin of CE. No attempt to identify unpublish data or assess publication bias was reported. The review methodology was poorly described in terms of the process and those conducting the review. It is therefore impossible to assess the potential impact of bias arising from flaws in the review methodology. Details of the included studies, the results of individual studies, and a summary of the findings of the review were clearly presented in tabular form. The narrative summary was appropriate given the limitations of the available data. The authors discussed the limitations of their review and the primary literature in detail, and their conclusions are appropriate for the data presented.

Implications of the review for practice and research
Practice: The authors made no specific recommendations for practice.

Research: The authors stated that a standardised definition of the parameters of CE is needed; research should analyse each component individually. They further stated that future research should include well-defined samples of children with similar abilities; research needs to focus on identifying optimal strategies for defined clinical groups.

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