Does horseback riding therapy or therapist-directed hippotherapy rehabilitate children with cerebral palsy?

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CRD summary
This review evaluated the effectiveness of horseback riding as therapy for children with cerebral palsy. The authors concluded that both hippotherapy and horseback riding are effective in improving gross motor skills. Given the methodological limitations of both included studies and the review, these conclusions should be treated with caution.

Authors' objectives
To evaluate the impact of horseback riding on gross motor function in children with cerebral palsy (CP).

Searching
The Cochrane Library and DARE were searched for reviews. MEDLINE, PubMed, Journals@Ovid and CINAHL were searched for English language articles published from January 1981 to December 2005; the search terms were reported. The references of retrieved articles were screened.

Study selection
Study designs of evaluations included in the review
Quantitative study designs were eligible for inclusion. The included studies were cohort, single case, before-after and case study designs.

Specific interventions included in the review
Studies of instructor-directed recreational horseback riding therapy (HBRT) and licensed therapist-directed hippotherapy were eligible for inclusion. Detailed descriptions of these interventions were provided. The duration of the intervention ranged from 6 to 26 weeks, with sessions lasting from 30 to 120 minutes. The intervention was carried out once or twice weekly.

Participants included in the review
Studies of children with CP were eligible for inclusion. The included studies were of children with CP, children with spastic CP only, or children with a range of developmental disabilities of which a subgroup had CP, or compared children with CP with non-disabled children. One case study was of a child with hemiplegic CP. Some studies compared children on the basis of severity of disability or whether they had quadriplegic or diplegic CP.

Outcomes assessed in the review
Studies of gross motor function were eligible for inclusion. The outcomes reported were the Gross Motor Function Measure (GMFM) total score, GMFM-C (kneeling and crawling), GMFM-E (walking, running and jumping), the Paediatric Evaluation of Disability Inventory (PEDI) total score and PEDI social score, percentage change in range of body movement and strength, and measures of lateral trunk displacement, posture and weight bearing of arms and legs.

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 authors did not state how the validity assessment was performed. The methodological quality of the included studies was assessed using the Critical Review Form for Quantitative Studies (Law et al.). This evaluated study quality according to 16 criteria, including the use of an appropriate study design, absence of bias, reliability and validity of outcomes measures, clear description of intervention, appropriate analysis and results reported with statistical significance. Each item scored 1 if it fully met the criterion and 0 if it did not fulfil the criterion, giving a maximum total score of 16.
Data extraction
The outcome data appear to have been extracted as given in each paper. These data included percentage change in body movement and strength, mean and standard deviation (SD) of lateral trunk displacement, and absolute scores or percentage changes for GMFM, along with associated statistical significance and p-values.

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

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative. The results of each study were discussed in turn.

How were differences between studies investigated?
The results were discussed separately for HBRT and hippotherapy.

Results of the review
Eleven studies (n=118) were included: 6 studies (n=89) of HBRT and 5 studies (n=29) of hippotherapy. There were 3 cohort studies (n=46), 1 single-case design (n=17), 4 before-and-after designs (n=47) and 3 case study designs (n=8).

The mean score for methodological quality was 9.8 (SD=3.8) out of a maximum of 16. One study scored 15, one scored 14, and four scored between 11 and 13; the remaining five scored less than 10. However, only 3 studies showed no evidence of bias and none of the studies justified the sample size.

Five of the 6 articles studying HBRT reported a significant impact on gross motor function (balance, co-ordination, strength, GMFM summed scores, GMFM-E and lateral trunk displacement).

All 5 studies of hippotherapy reported a positive impact on gross motor function (posture, weight bearing, GMFM-E, GMFM-C, GMFM total score, functional mobility on the PEDI, PEDI social score and total PEDI score).

Authors' conclusions
Individually, both HBRT and hippotherapy are effective interventions for gross motor rehabilitation for children with CP.

CRD commentary
Inclusion criteria for the intervention, participants and outcomes were clear, whereas those for the study design were broad. The inclusion of studies with participants with developmental disorders may affect the generalisability of findings, although this was likely to be a limitation in the available evidence rather than the review itself. Several relevant sources were searched, but the authors do not appear to have taken steps to minimise language and publication bias; this means that important data might have been missed. There was insufficient information about the study selection, data extraction and quality assessment process to determine whether these had been carried out independently by more than one reviewer, thus the possibility of bias cannot be ruled out. A quality assessment was carried out and the findings were reported in detail. Methodological limitations evident in the included studies were: the inclusion of participants with developmental disabilities other than CP, lack of statistical analysis, small sample sizes, use of outcome measures which have not been proven reliable or valid, and the possibility of bias. Study quality and study design do not appear to have been considered sufficiently when interpreting the results.

Given the heterogeneity of the included studies, the authors’ decision to use a narrative synthesis was appropriate. In light of methodological limitations within the included studies and the review itself, the authors’ conclusions should be treated with caution.

Implications of the review for practice and research
Practice: The authors stated that clinicians can justifiably recommend HBRT or hippotherapy as medically indicated therapy for gross motor rehabilitation of children with CP.

Research: The authors stated that the need for further large-scale research with matched controls of children across the...
spectrum of CP type, aetiology, distribution and time of onset. Sufficiently large samples should be gathered to include children across the range of gross motor functioning, as measured by the Gross Motor Function Classification System. Studies should include long-term follow-up (>16 weeks) and limit confounding variable such as exposure to other therapies. Studies comparing HBRT and hippotherapy should also be conducted.

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