TITLE: Mirror Therapy for Children with Hemiplegia: Clinical Effectiveness

DATE: 21 October 2016

RESEARCH QUESTION

What is the clinical effectiveness of mirror therapy for children with hemiplegia?

KEY FINDINGS

One systematic review, four randomized controlled trials, and two non-randomized studies were identified regarding clinical effectiveness of mirror therapy for children with hemiplegia.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No methodological filters were applied to the main search to limit retrieval by study type. Methodological filters were applied to a broad secondary search to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, and non-randomized studies. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2011 and October 13, 2016. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

SELECTION CRITERIA

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.
Table 1: Selection Criteria

| **Population** | Pediatric patients (age 0 to 18 years) with hemiplegia (can result from stroke, cerebral palsy, acquired brain injury, brain surgeries for seizures) |
| **Intervention** | Mirror therapy |
| **Comparator** | Usual care: constraint-induced movement therapy; bimanual therapy; no therapy |
| **Outcomes** | Effectiveness of mirror therapy in general and in relation to comparators |
| **Study Designs** | Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies |

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials and non-randomized studies.

One systematic review, four randomized controlled trials (RCTs), and two non-randomized studies were identified regarding the clinical effectiveness of mirror therapy for children with hemiplegia. No health technology assessments were identified.

Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

One systematic review, four randomized controlled trials, and two non-randomized studies were identified regarding the clinical effectiveness of mirror therapy for children with hemiplegia. The 2014 systematic review studied upper limb therapies for children with unilateral cerebral palsy (CP). It is not clear from the abstract how many of the included studies used mirror therapy. The authors stated that mirror therapy should be viewed as experimental.

The four RCTs and two non-randomized studies identified for inclusion in this report are summarized in Table 2. Overall, the reports found that there was functional improvement with mirror therapy, but that there was no statistical significance in outcomes between the mirror therapy groups and the groups receiving other types of therapy.
<table>
<thead>
<tr>
<th>First author, Year of publication</th>
<th>Population</th>
<th>Intervention and Comparator</th>
<th>Results</th>
</tr>
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<tbody>
<tr>
<td><strong>Randomized Controlled Trials</strong></td>
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<tr>
<td>Auld, 2016*</td>
<td>6 children (aged 6-18 years) with unilateral CP</td>
<td>Crossover study of mirror-based training versus bimanual therapy; 1, 90-min session of each therapy</td>
<td>Tactile perception improved in 4 children with mirror-based training but not with bimanual therapy (statistical significance not reported)</td>
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<tr>
<td>Bruchez, 2016*</td>
<td>90 children (aged 7-17 years) with hemiparesis</td>
<td>Simultaneous arm training using mirror therapy versus simultaneous arm training without mirror; 15 min/day, 5 days/wk, duration of 5 wks</td>
<td>No significant differences in outcomes or progression between the 2 groups</td>
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<td>Nour, 2016*</td>
<td>30 children (aged 4-8 years) with hemiparesis</td>
<td>Occupational therapy using mirror apparatus versus occupational therapy without mirror apparatus; 1.5 h/session, 3 sessions/wk, duration of 2 months</td>
<td>Significant improvement in hand function for both groups, with no significant difference between groups</td>
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<tr>
<td>Gygax, 2011*</td>
<td>10 children (aged 6-14 years) with hemiplegia</td>
<td>Crossover study of bimanual training with a mirror versus bimanual training without a mirror; 15 min/day; duration of 3 wks</td>
<td>Mirror training significantly improved grasp strength and upper limb dynamic position (improved but not significantly improved compared with bimanual training alone). Bimanual training alone significantly improved pinch strength (improved, but not significantly compared with mirror therapy)</td>
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<tr>
<td><strong>Non-Randomized Studies</strong></td>
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<tr>
<td>Pasquet, 2016*</td>
<td>28 children (mean age 11.9 years) with hemiplegic CP</td>
<td>Self-rehabilitation program using mirror therapy at home; 7 exercises for total of 15 min; 5 days/wk; duration of 5 wks; No comparator</td>
<td>Good protocol compliance was observed but the abstract does not provide results of the therapy</td>
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<td>Smorenbarg, 2013*</td>
<td>Children and adolescents with spastic hemiparetic CP; number of participants not reported; 40 sessions were performed</td>
<td>Bimanual target matching using a mirror versus bimanual target matching with no mirror</td>
<td>Improvement in matching accuracy was similar for both groups (statistical significance not reported)</td>
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</table>

*CP = cerebral palsy; h = hours; min = minutes; wk = week.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified

Systematic Reviews and Meta-analyses

Randomized Controlled Trials


Non-Randomized Studies


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APPENDIX – FURTHER INFORMATION:

Systematic Reviews – Alternate Indication


Non-Randomized Studies - Motor Imagery


Review Articles
