Postural management to reduce or prevent hip migration in children with cerebral palsy: a systematic review

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Background
Hip migration is a common problem in children with cerebral palsy (CP), which ultimately can lead to hip dislocation. Conservative approaches to the management of hip migration have become popular over the last decade, particularly the use of postural management equipment. Postural management is defined as all non-surgical approaches like postural management equipment, orthosis or individual therapy sessions. An in-depth evaluation of the evidence of postural management is necessary to reach a unified approach in managing hip migration in children with CP.

Methods

Inclusion criteria
Children (0-18 years) diagnosed with CP
Postural management to reduce or prevent hip migration
Migration percentage (MP) as outcome

Exclusion criteria
Focus on surgical or pharmacological interventions
Not available in English

Results

<table>
<thead>
<tr>
<th>Picciolini et al., 2016</th>
<th>LoE</th>
<th>MQA score</th>
<th>GMFCS</th>
<th>n</th>
<th>Position</th>
<th>Dose</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>III</td>
<td>12/17</td>
<td>III-IV-V</td>
<td>32</td>
<td>Sitting</td>
<td>Siege moulé: 5h/day NDT: 45min, 2x/week</td>
<td>Significant difference between groups with stability of MP in treatment group and marked worsening of MP in controls</td>
<td></td>
</tr>
<tr>
<td>Macias-Merlo et al., 2016</td>
<td>III</td>
<td>9/17</td>
<td>III</td>
<td>13</td>
<td>Standing</td>
<td>70-90min/day in 60-65° abduction Weekly physiotherapy</td>
<td>MP remained significantly within stable limits in children who stood in abduction in comparison to children who did not stand in abduction</td>
</tr>
<tr>
<td>Martinsson et al., 2011</td>
<td>III</td>
<td>9/17</td>
<td>III-IV-V</td>
<td>11</td>
<td>Standing</td>
<td>0,5-1,5h/day max abduction</td>
<td>Significantly less chance of both hips being subluxated in recommended group. No significant differences in MP between the historical controls and the intervention groups at 5 years</td>
</tr>
<tr>
<td>Pountney et al., 2009</td>
<td>IV</td>
<td>8/17</td>
<td>III-IV-V</td>
<td>39</td>
<td>Standing Sitting Lying</td>
<td>Recommended: Lying at night + seating =6h/day + standing ≈1h/day</td>
<td>Significantly more hip integrity in 24h-group than other groups</td>
</tr>
<tr>
<td>Dalén et al., 2010</td>
<td>IV</td>
<td>6/17</td>
<td>IV/V</td>
<td>18</td>
<td>Standing</td>
<td>4-164min/day</td>
<td>Significant negative association between standing time and hip dislocation</td>
</tr>
<tr>
<td>Hankinson et al., 2002</td>
<td>IV</td>
<td>4/17</td>
<td>?</td>
<td>11</td>
<td>Lying</td>
<td>9-9,4h/night</td>
<td>Significant improvement of MP in comparison to the baseline period, but only for one side</td>
</tr>
<tr>
<td>Pountney et al., 2002</td>
<td>IV</td>
<td>4/17</td>
<td>?</td>
<td>59</td>
<td>Standing Sitting Lying</td>
<td>24h lying, sitting, standing or less use</td>
<td></td>
</tr>
<tr>
<td>Picciolini et al., 2009</td>
<td>V</td>
<td>3/17</td>
<td>?</td>
<td>2</td>
<td>Standing Sitting</td>
<td>Case 1: Sitting: 5h/day Case 2: dose not described</td>
<td>MP reduction of 5-39%, no statistics</td>
</tr>
</tbody>
</table>

Conclusion
The evidence for postural management to prevent or reduce hip migration in children with CP is limited by the lack of high-quality studies. Considering the reported results, there is a positive trend for the use of hip abduction in postural management. Solid recommendations for clinical practice are not possible. Future high-quality research is crucial to improve our understanding of the effects of postural management to prevent hip migration in children with CP.

N=655

N=8

Methodological Quality Assessment (MQA) and appraisal according to the AACPDM Systematic Review Methodology

LoE = Level of Evidence
Cohort study with concurrent controls
Cohort study without concurrent controls / case series
Case Report

Reporting positive results on MP
Reporting conflicting results on MP
Reporting negative results on MP

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