RELIABILITY OF GAIT DEVIATION INDEX IN CHILDREN WITH SPASTIC CEREBRAL PALSY

Rasmussen, Helle Mätzke; Nielsen, Dennis Brandborg; Pedersen, Niels Wisbech; Overgaard, Søren; Holsgaard-Larsen, Anders

Publication date:
2014

Document version
Submitted manuscript

Citation for published version (APA):

Terms of use
This work is brought to you by the University of Southern Denmark through the SDU Research Portal. Unless otherwise specified it has been shared according to the terms for self-archiving. If no other license is stated, these terms apply:

- You may download this work for personal use only.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying this open access version

If you believe that this document breaches copyright please contact us providing details and we will investigate your claim. Please direct all enquiries to puresupport@bib.sdu.dk
RELIABILITY OF GAIT DEVIATION INDEX IN CHILDREN WITH SPASTIC CEREBRAL PALSY

Department of Orthopaedic Surgery and Traumatology Odense University Hospital, Odense, Denmark and Institute of Clinical Research University of Southern Denmark, Odense, Denmark

AIM
The aim of this study is to investigate intra-assessor reliability of Gait Deviation Index in children with spastic cerebral palsy across two repeated sessions.

CONCLUSIONS
The present observed moderate to good reliability holds promise for the use of GDI as an outcome in clinical research.

INTRODUCTION AND AIM
Children with cerebral palsy (CP) often exhibit an altered gait pattern. Instrumented gait analysis (IGA) is used to describe specific gait pattern and impairments.

Gait Deviation Index (GDI) is based upon kinematic data from the IGA, and is an overall quantitative index that summarizes the overall gait function into a single score for right and left side of the body for each patient.

Satisfactory concurrent validity and construct validity of the GDI have been shown in children with CP. However, test-retest intra-assessor reliability of GDI in children with CP has not previously been investigated.

The aim of this study is to investigate intra-assessor reliability of Gait Deviation Index in children with spastic CP across two repeated sessions.

METHODS
18 children (mean age 7.98 years, SD 2.11) with spastic CP (10 unilateral and 8 bilateral), at GMFCS level I and II (9 children at each level).

For intra-assessor reliability IGA was completed by one out of three assessor teams (figure 1) on two different days, separated by 0-9 days. The children walked at a self-selected walking speed.

The IGA was performed using a 6-camera Vicon MX system, Oxford, UK movement analysis system (100 Hz) with the Plug-in-Gait marker set.

The GDI score of five successfully trials, with a consistent velocity (± 15%), were obtained and the median GDI score for each child on the left and right side (a total of 72 GDI scores) were used for further analysis.

Intra-assessor reliability was investigated with Bland-Altman plots, calculation of Intraclass correlation coefficient (ICC), Standard error of measure (SEM), and smallest detectable change (SDC) based on 95% confidence intervals.

RESULTS AND CONCLUSION
The reliability for GDI for children with CP was found to be moderate to good. The smallest detectable change with 95% confidence interval was found to be 12.7 to 17.4 points (Table 1). No significant learning effect and/or systematic bias were observed in the Bland-Altman plot between test and retest (Figure 2). Furthermore the SEM 95% confidence interval included zero.

The present observed moderate to good reliability holds promise for the use of GDI as an outcome in clinical research.

Table 1 Results of intra-assessor reliability

<table>
<thead>
<tr>
<th>Assessor</th>
<th>Legs (N)</th>
<th>Mean S1 (SD)</th>
<th>Mean S2 (SD)</th>
<th>Diff. (SD)</th>
<th>ICC [95%CI]</th>
<th>SEM [95%CI]</th>
<th>SDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall scores</td>
<td>36</td>
<td>79.1 (12)</td>
<td>79.4 (12)</td>
<td>0.3 (7)</td>
<td>0.81 [0.7-0.9]</td>
<td>5.3 [-5.1-15.8]</td>
<td>14.7</td>
</tr>
<tr>
<td>Team A</td>
<td>10</td>
<td>78.6 (15)</td>
<td>81.2 (13)</td>
<td>-2.6 (9)</td>
<td>0.80 [0.6-1.0]</td>
<td>6.3 [-6.0-18.6]</td>
<td>17.4</td>
</tr>
<tr>
<td>Team B</td>
<td>14</td>
<td>75.8 (10)</td>
<td>74.0 (10)</td>
<td>1.8 (7)</td>
<td>0.74 [0.6-0.9]</td>
<td>5.2 [-5.0-15.3]</td>
<td>14.3</td>
</tr>
<tr>
<td>Team C</td>
<td>12</td>
<td>83.4 (11)</td>
<td>84.3 (13)</td>
<td>-0.9 (7)</td>
<td>0.84 [0.8-1.0]</td>
<td>4.6 [-4.4-13.6]</td>
<td>12.7</td>
</tr>
</tbody>
</table>

Abbreviations: S1: Session 1, S2: Session 2, Diff.: Mean difference, ICC: Intraclass correlation coefficient, SEM: Standard error of measure, and SDC: smallest detectable change.