Intra-individual Motor Trajectories of Very Preterm Infants through to 15 Months Corrected Age

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Introduction

With regard to early gross motor development in typically developing infants, fluctuations in scoring patterns within individuals over time have been reported.1 Infants born preterm appear to have their own pathways in different aspects of their development compared to infants born full-term.2 Little is known about their intra-individual trajectories.

Objective: This study aimed to explore intra-individual variability of early gross motor developmental trajectories through to 15 months corrected age (CA) in infants born at <30 weeks of gestation or with a birth weight <1000 grams.

Results

Table 1: Characteristics of the cohort

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Count (%)</th>
<th>Min. – Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age: mean (SD) weeks</td>
<td>28 (1.57)</td>
<td>24.7 – 32.0</td>
</tr>
<tr>
<td>Birth weight: mean (SD) g</td>
<td>1064 (241)</td>
<td>570 – 1680</td>
</tr>
<tr>
<td>Ethnicity: non-Western</td>
<td>n=20 (17.7)</td>
<td></td>
</tr>
<tr>
<td>Multiple birth: twins/triplets</td>
<td>n=43 (38.1)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Z-scores AIMS PT norms displayed at the 3 time points cross-sectional

Linear Mixed Effects Model with a first order autoregressive correlation provided the best fit: Correlation between T1-T3 < T1-T2 or T2-T3

Table 2: Within-subject differences in AIMS Z-scores over time

<table>
<thead>
<tr>
<th>Interval</th>
<th>Mean difference</th>
<th>95% CI</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2-T1</td>
<td>0.21</td>
<td>-0.009 to +0.436</td>
<td>1.126</td>
<td>-2.32</td>
<td>3.00</td>
</tr>
<tr>
<td>T3-T1</td>
<td>-0.75*</td>
<td>-0.986 to -0.511</td>
<td>1.201</td>
<td>-4.76</td>
<td>1.85</td>
</tr>
<tr>
<td>T3-T2</td>
<td>-0.96*</td>
<td>-1.148 to -0.776</td>
<td>0.942</td>
<td>-3.67</td>
<td>1.32</td>
</tr>
</tbody>
</table>

Figure 2: Z-scores AIMS within-subject longitudinally

Conclusion

The value of early prediction of gross motor developmental problems is restricted due to within-subject variability. The variability in intra-individual gross motor trajectories advocates a developmental surveillance during a neonatal follow-up program to determine the need of early intervention, instead of decisions on single point assessments.

Method

Design: Prospective longitudinal cohort study with three measurements
T1: 3 months CA (home setting)
T2 and T3: 6 and 15 months CA (in neonatal follow-up clinic)

Included: n=112 (53.6% boys)
Excluded: n=17 abnormal medical condition
n=1 atypical locomotion

Measurement: Alberta Infant Motor Scale (AIMS)3; single construct: gross motor maturity; preterm norm values were used.4

We previously reported on this cohort infants (2013) but with different research questions.5,6

Data analysis: Descriptives and analysis of differences in Z-scores between T2-T1, T3-T1 and T3-T2

Linear mixed model analysis

References: