Upsee Daisy! Gross Motor Outcomes after Dynamic Weight Bearing in Two Children with Truncal Hypotonia: A Case Series

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Upsee Daisy! Gross motor outcomes after dynamic weight bearing in two children with truncal hypotonia: a case series

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Background and Purpose

- Poor postural control associated with central hypotonia limits a child’s ability to interact with the environment, delaying attainment of developmental milestones.
- Supported standing programs are commonly used to ameliorate impairments and optimize function in children with poor postural control.
- Increased social interactions as well as reduced burden of care have all been associated with supported standing programs.
- The Upsee is an orthotic standing and walking device which is worn by the child in the supine position.
- Families were asked to keep a journal of the amount of time spent in the Upsee.
- There are no reports of the effectiveness of the Upsee as a dynamic standing program.

The purpose of this case series was to report the impact of a home-based dynamic standing program on postural control and gross motor activity in two children with truncal hypotonia.

Case Description

Child 1: 24-month-old boy diagnosed at birth with a rare form of chromosome 3 deletion and agenesis of the corpus callosum. His Gross Motor Function Classification System (GMFCS) classification was Level IV.

Child 2: 21-month-old boy born at 39 weeks gestation. His GMFCS classification was Level V.

Methods

- 12-week home-based program of upright dynamic weight bearing using the Upsee device.
- Harness system was adjusted by a physical therapist during the first 12 months of age.

Table: Results of outcome measures at initial and post intervention

<table>
<thead>
<tr>
<th>Functional Impairment</th>
<th>Activity Limitations</th>
<th>Participation Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truncal hypotonia</td>
<td>• Play activities</td>
<td>• Decreased strength</td>
</tr>
<tr>
<td>Child 1: hypotonia of 1</td>
<td>• Family routines</td>
<td>• Decreased balance</td>
</tr>
<tr>
<td>Child 2: hypotonia of</td>
<td>• Caregiving routines</td>
<td></td>
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<tr>
<td>extremities</td>
<td>(eating, dressing,</td>
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<td></td>
<td>bathing)</td>
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<td>• Transitional</td>
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<tr>
<td></td>
<td>movements (pull to</td>
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<td></td>
<td>stand, sit ↔ supine,)</td>
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<tr>
<td></td>
<td>• Creeping</td>
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<td>• Standing</td>
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<td></td>
<td>• Walking</td>
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<td></td>
<td>• Wheelchair mobility</td>
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</tbody>
</table>

Discussion

- Children with truncal hypotonia can participate in, and benefit from, a dynamic standing program using the Upsee.
- We speculate that this program may be effective in improving the gross motor abilities of children with severely impaired postural control.
- Both children’s actual change exceeded the expected change by 23 to 30%, suggesting effectiveness of the intervention versus natural development.
- Of the two children, Child 1 demonstrated more improvement in gross motor function and trunk control.
- One possible reason for this is that Child 2 presented with increased extensor tone of his four extremities, which increased when he became excited or when attempting to focus on an activity at hand and constrained his movement activity.
- Also, Child 2 spent less time overall in the Upsee, never progressing beyond 15 minutes of weight bearing per session.
- Future research is needed to further explore the necessary dosage of an upright dynamic weight bearing program for children with impaired postural control.
- Studies with a more homogenous and larger sample are needed to conduct a randomized controlled trial design comparing the use of the Upsee to a traditional standing frame.
- Future studies should also aim to capture changes across the full ICF-CY model, including activities and participation.

Conclusion

The findings from this case series support the use of the Upsee as a new home-based upright dynamic weight bearing program for children with impaired postural control.

References