Outcomes of a Camp-Based Intensive Therapy Approach to Promote Functional Independence in Children Diagnosed With Developmental Disabilities

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Background:
Healthy People 2010 and 2020 include the objectives “to reduce the proportion of children and adolescents who are overweight or obese” and “to increase the proportion of adolescents that meet current physical activity guidelines for aerobic physical activity and for muscle-strengthening activity” (1). Compared to their peers, children with cerebral palsy are at increased risk for overweight and obesity, which can be associated with decreased functional status and cardiovascular disease (2). In addition to impacting body weight and cardiovascular health, participation in physical activity may also prevent other secondary complications of cerebral palsy such as pressure ulcers, decreased bone density, and joint contractures (3).

Program Description:
The Focused Interdisciplinary Therapy Program at Kennedy Krieger Institute offers children and adolescents with persistent, disabling conditions intensive therapy that targets specific therapeutic goals. Given high demand for enrollment in this program during summer months, a group-based model of intensive therapy is implemented. This poster reports the outcomes of three 7- to 8-year-old girls, GMFCS level 1-2, who participated in an intensive therapy group during the summer of 2013.

Camper participation in these three groups of children with cerebral palsy was divided into an hour of yoga/stretching, an hour of cardiovascular activities (dancing, riding adaptive trikes, walking/run/jumping while playing games), and an hour of strengthening activity (upper limb coordination). BOT-2 upper limb coordination improvements were noted in 2/3 participants, but manual dexterity actually decreased for 2/3 participants. All participants had a small increase on PEDS-QL score, and improved on the COPM goal areas identified by families were coded using the ICF-CY (World Health Organization, 2008). Standardized assessments completed pre and post program included sections of the Bruininks-Oseretsky Test of Motor Proficiency, Second Edition (BOT); the Pediatric Quality of Life Inventory (Peds-QL); and the Canadian Occupational Performance Measure (COPM). COPM goal areas identified by families were coded using the ICF-CY (World Health Organization, 2007) using the method described in Cieza et al., 2005 (4). Change in COPM pre to post program and reported in table 1. All participants, but manual dexterity actually decreased for 2/3 participants. 2/3 participants also had clinically significant changes (>2) on COPM satisfaction and performance scores.

Discussion:
The literature describes a variety of approaches to address fitness in children with cerebral palsy with varying degrees of success. Most employ after-school gym programs for 1-2 hours and last 4-12 weeks (5-8). Few, if any, programs have described an intensive group-based fitness camp model. Intensive therapy approaches for children with cerebral palsy are emerging as effective in encouraging improvements in motor function (9). The optimal intensity and specificity of intervention to address fitness in youth with cerebral palsy requires further investigation.

Table 1: Participant Information and Results

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age of evaluation</th>
<th>Diagnosis</th>
<th>MACS</th>
<th>GMFCS</th>
<th>Change BOT Motor</th>
<th>Change BOT Upper Limb</th>
<th>Change BOT Balance</th>
<th>Change BOT Trunk</th>
<th>Change BOT Strength</th>
<th>Change % PedsQL</th>
<th>COPM Goal Areas</th>
<th>Changes in COPM</th>
<th>Changes in PedsQL</th>
<th>Changes in COPM Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Female 8</td>
<td>Herniebic-injuries</td>
<td>Cerebral palsy</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>-1</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>(4404) Manipulating, (4408) rand and arm use unspecified, (5001) climbing, (5002) running, (5101) writing, (5102) sitting</td>
<td>3.25</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>2. Female 7</td>
<td>Developmental delay</td>
<td>Cerebral palsy</td>
<td>3</td>
<td>2</td>
<td>-1</td>
<td>8</td>
<td>13</td>
<td>4</td>
<td>5</td>
<td>5.63</td>
<td>(4504) Connecting with many people, (4701) writing, (5001) power of isolated muscles or muscle groups, (5002) power of muscle groups</td>
<td>4.25</td>
<td>7.25</td>
<td></td>
</tr>
<tr>
<td>3. Female 8</td>
<td>Hemiebic-stroke in 2010</td>
<td>Cerebral palsy</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>12</td>
<td>7</td>
<td>3</td>
<td>4.64</td>
<td>(4404) power of isolated muscles or muscle groups, (4710) Basic Personal Interactions, (4409) hand and arm use unspecified, (5200) power of isolated muscles or muscle groups</td>
<td>-0.25</td>
<td>-0.5</td>
<td></td>
</tr>
</tbody>
</table>

Key: MACS: Manual Ability Classification System; GMFCS: Gross Motor Function Classification System

References:
9. Asymptotic significance calculations were based on simulations. (b7300) power of isolated muscles or muscle groups, (D4551) climbing, (d4402) manipulating (d4459) hand and arm use unspecified, (d170) writing, (b7300) power of isolated muscles or muscle groups

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