Patients with Scoliosis in the Setting of Cerebral Palsy (CP) Are at a Higher Risk for Needing Assistive Devices

Megan Campbell, MA1; Christopher Deallie2; Hiroko Matsumoto, MA PhDc; Fay Callejo2; Nicole Bainton2; Michael Vitale, MD MPH2; Joshua Hyman, MD2; Benjamin D. Roye, MD MPH2; David P. Roye, MD2

1. Rutgers New Jersey Medical School, Newark, NJ 2. Columbia University Medical Center, New York, NY

INTRODUCTION

- Patients with CP undergo spine surgery to correct spinal deformity or alleviate effects of respiratory and gastrointestinal medical comorbidities
- Evidence demonstrating association between spinal deformity and these comorbidities is lacking [1]

STUDY OBJECTIVE

Examine the association between scoliosis severity and respiratory or gastrointestinal dysfunction in patients with CP

METHODS

- **Study Design:** Cross-sectional study using patient/parent survey over the phone
- **Participants:** Patients diagnosed with CP and scoliosis between July 2005 and November 2016
- **Outcome:** Use of assistive devices as proxy for pulmonary or gastrointestinal dysfunction at time of survey
  - Assistive devices included ventilation, tracheostomy, supplemental O2, cough assist, or other devices. Tube feed included nasogastric, jejunostomy, or gastrostomy.

RESULTS

- 94 patients included
- 24 (25%) reported use of respiratory aids (RA)
- 38 (40.4%) reported needing tube feeding (TF)

GMFCS 4-5 required TF & RA significantly more than GMFCS 1-3 patients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio</th>
<th>p-value</th>
<th>Lower 95% CI</th>
<th>Upper 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cobb &gt; 70°</td>
<td>10.32</td>
<td>0.01</td>
<td>1.75</td>
<td>61.00</td>
</tr>
<tr>
<td>GMFCS 4-5</td>
<td>3.80</td>
<td>0.10</td>
<td>0.79</td>
<td>18.40</td>
</tr>
<tr>
<td>Age</td>
<td>0.92</td>
<td>0.02</td>
<td>0.85</td>
<td>0.99</td>
</tr>
<tr>
<td>GMFCS Level 4 or 5</td>
<td>12.37</td>
<td>0.002</td>
<td>2.44</td>
<td>62.67</td>
</tr>
<tr>
<td>Age</td>
<td>0.85</td>
<td>&lt; 0.001</td>
<td>0.78</td>
<td>0.93</td>
</tr>
</tbody>
</table>

RISK OF RESPIRATORY AIDS USE & RISK OF TUBE FEEDING USE INCREASES SHARPLY (DOUBLES) AT CORONAL CURVATURE 40°

CONCLUSIONS

- Scoliosis severity is associated with pulmonary and gastrointestinal decline adjusting for GMFCS level and age
- Results support surgical intervention at 40°-50° in patients with CP to avoid comorbidity-associated complications
- Future studies are needed to assess whether surgical intervention to correct spinal deformity is associated with improved outcomes for these medical comorbidities

REFERENCES