Systematic Review of Selected Outcomes, Complications and Postoperative Considerations Among Surgical Interventions For Scoliosis in Children With Cerebral Palsy

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**Purpose**
The purpose of this study was to evaluate outcomes, complications and postoperative considerations among surgical interventions for scoliosis in children with cerebral palsy (CP).

**Methods**
A literature search of Google Scholar, CINAHL, PubMed and ProQuest Central was conducted using search terms: (cerebral or pediatric) AND (cerebral palsy or CP) AND (scoliosis or spinal curvature) AND (surgery or surgical interventions). Search limits: English, human subjects, peer reviewed. Selection criteria: children under 18 and over with diagnosis of cerebral palsy who received a surgical intervention and studies had to measure Cobb angle and pelvic obliquity as an outcome. Two reviewers independently assessed each study for methodological quality and came to a consensus based on MINORS guidelines.

**Results**
A total of 4,280 titles were screened for eligibility. Following detailed appraisal, 7 retrospective cohorts met the criteria. MINORS scores ranged from 10-20/24 with a mean of 16/24. Sample sizes ranged from 27 to 157 subjects (396 total) with mean age of 13.7 years. The surgical procedures examined included anterior or posterior approach spinal fusions, using either custom rods, growing rods or Luque Galveston or Contrel Duboussést instrumentation. Outcomes measurements of Cobb and pelvic obliquity angles were taken pre-op, post-op, and at follow up mean 4.68 years. The mean pre-op Cobb angle was 84.6°(70-100.84°), post-op the angle was 36.8°(31-59°) and the mean follow up was 36.2°(13-50°). The mean pre-op pelvic obliquity was 22.8°(15-23°), post-op mean was 8.35° (9-59°), and the mean at follow up was 9.6°(6-22°). Immediate post op results were not recorded in one study. In four studies, patients experienced infectious complications. In three studies, hardware was changed due to malformation. In three studies, patients experienced pulmonary complications. There was an overall blood loss mean of 1602 mL and mean hospital stay of 11.5 days.

**Conclusions**
There is moderate evidence in support of surgical interventions to improve Cobb and pelvic obliquity angles post-op and at follow up in pediatric patients with CP and scoliosis. The results suggest that parents and clinicians can expect a decrease in Cobb angle of 54.6% (36-86%) and pelvic obliquity decrease of 51.59% (18-89%) and a 11 day hospital stay. Limitations include lack of comparators for surgical procedures and lack of standardization with CP diagnoses. Future research is needed with specific CP diagnoses and better inclusion and exclusion criteria to determine effectiveness.

**Clinical Relevance**
As medical advances occur, there are more options for treatment of scoliosis in children with CP. It is important for clinicians to understand the expected outcomes of scoliosis surgery, identifying possible complications for children with CP and to educate parents and caregivers. Though quality of life was not directly assessed, the long term outcomes may improve physical well being and cosmesis.

**References**