Regional Variation in Outcomes in Pediatric Scoliosis Surgery in the United States

Anushree K. Doshi, MD; Andrea Udani, MD; Lisa Einhorn, MD; Nathaniel Greene, MD, MHS, FAAP
Department of Anesthesiology Division of Pediatric Anesthesia, Duke University Medical Center, Durham, NC 27710, USA

INTRODUCTION

• Pediatric patients with scoliosis undergoing spinal fusion can thoughtfully select their surgeon, hospital, and rehabilitation facilities.
• Factors often considered are cost, complications, and length of hospitalization.
• Limited research has shown that care is not uniform across the United States

METHODS

• The retrospective cohort study utilized the 2012 Kid's Inpatient Database (KID).
• KID is a publically available pediatric inpatient database comprised of pediatric inpatient and discharge information from 44 states with de-identified data from 2-3 million inpatient pediatric records from 2,500 – 4,100 hospitals for patients under the age of 21.
• Pediatric patients who underwent spinal fusions for scoliosis were selected by using relevant International Classification of Disease, Ninth Revision (ICD-9) procedure codes.
• Hospital costs were calculated by multiplying reported charges and hospital specific cost-to-charge ratios.
• Exploratory multivariable linear regressions were used to investigate potential interactions between insurance status and geographic region.

RESULTS

Analysis of the 2012 KID database revealed 7,535 posterior spinal fusion procedures (weighted estimate 10,720). Relevant findings included:
• Length of stay (LOS) varied significantly from 6.29 to 6.99 days (p<0.001, Figure 1). Hospital costs also varied significantly from $54,910 to $68,465 per admission (p = 0.02, Figure 2).
• The West census region was associated with the highest cost of surgery and the highest length of stay.
• Exploratory multivariable analysis suggests the effect of insurance may be different within census regions (Tables 1). Insurance status may have affected LOS in certain regions (Table 2).

CONCLUSION

• For pediatric patients in the United States undergoing spinal fusions to treat pediatric scoliosis, there was a significant difference in cost and length of stay across different regions.
• The average cost of surgery was almost $14,000 less then if surgery was performed in the Northeast compared to the West.
• Length of stay appeared to be 6-7 days within all regions. However, when separated by insurance status, LOS appeared unequal particularly in the West and Midwest.
• It may be worth exploring if insurance status, comorbidities, or complications drive these costs to be higher in certain regions.
• As high volume pediatric centers are able to accommodate for complex inpatient procedures and have additional resources for pediatric pathologies, it would be worthwhile to compare outcomes from general hospital to dedicated high volume pediatric surgical centers.
• There is already evidence that low volume centers are at higher risk for reoperation for pediatric patients undergoing spinal fusion indicating that case volume and resource allocation play a significant role in the surgical outcomes for pediatric patients.

REFERENCES