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Evaluating the NSQIP Surgical Risk Calculator for Pediatric Craniosynostosis Surgery

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Introduction

The American College of Surgeons National Surgical Quality Improvement Program - Pediatric (NSQIP-P) risk calculator includes subspecialty surgeries. There have been no studies assessing the risk calculator's performance in pediatric neurosurgery. We aimed to evaluate the quality of the predictions from the risk calculator compared to our single institution experience in craniosynostosis surgery.

Methods

Craniosynostosis surgeries performed between 2012-2016 at our tertiary academic freestanding pediatric hospital were evaluated using the NSQIP-P risk calculator. Descriptive statistics and Pearson correlation analysis were performed comparing the predicted 30-day postoperative events and clinically observed outcomes.

Results

202 craniosynostosis surgeries were in our series. Median age was 0.74 years (range 0.15-6.32); 74% were <1 year of age; 66% male. 23% had more than one suture involved. (13% bicoronal, other 11% multisuture). Blood transfusion occurred in 162/202 patients (80%). 26/202 patients had a genetic diagnosis, classified as syndromic craniosynostosis. The risk calculator had reasonable predictions of NSQIP-P recorded postoperative events, where predicted and observed rates with a composite complications variable had no significant difference (p=0.06). Factors and outcomes specific to craniosynostosis surgery are not collected by NSQIP-P nor reflected in the risk calculator. Postoperative events occurred in <3%, including hardware breakage, unintended intraoperative extubation, tracheal-cartilaginous sleeve associated with critical airway, and surgical site infection.

Conclusions

The risk calculator has reasonable ability to predict systemic perioperative complications in patients undergoing craniosynostosis surgery with a composite complications outcome. Given the low rate of observed complications in this cohort, nuanced breakdown of the calculator's ability to predict specific complications was not feasible.

Learning Objectives

By the conclusion of this session, participants should be able to (1) assess use of a risk calculator for predicting systemic perioperative complications (2) apply the context of the NSQIP risk calculator to craniosynostosis surgery.

References

Kraemer K, Cohen ME, Liu Y et al. Development and Evaluation of the American College of Surgeons NSQIP Pediatric Surgical Risk Calculator. J Am Coll Surg. 2016 Nov; 223(5):665-693.

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