

# Article Appraisal

**Article:** Race, Postoperative Complications and Death in Apparently Healthy Children

**Date of Journal Club:** September 15<sup>th</sup>, 2020

**Resident Reviewer Name(s) and Residency Affiliation:** Spencer Heffernan, PGY-3 CCFP-EM, St. Paul's Site

**Faculty Methodology/Bio-statistics Resource Person:** Frank Scheuermeyer

---

## Background and Study Objective(s):

Race has been associated with postoperative morbidity and mortality in previous studies in children, however the differences have been largely attributed to a difference in preoperative comorbidities. This study focused on a population of healthy children to clarify if baseline comorbidities explained the difference in postoperative outcomes between African American and white children.

## Study Design:

In this retrospective cohort study, patient information was obtained from the American College of Surgeons National Surgical Quality Improvement Program – Pediatric (NSQIP-P) database from 2012-2017.

Inclusion criteria were children  $\leq 17$  years of age, ASA status 1 or 2 who underwent inpatient surgery that were either African American (AA) or white. Exclusion criteria were ASA status  $\geq 3$ , those who had outpatient procedures and races other than AA or white. The primary outcome was 30-day postoperative mortality and secondary outcomes were a composite of all postoperative outcomes, as well as serious adverse events (SAEs) defined cardiac arrest, sepsis, readmission and reoperation, reported as a corrected odds ratio.

Outcomes were described as a function of race by comparing AA to white children. Race was either self-assigned or assigned by a clinical nurse specialist. Logistic regression was used to estimate the crude and adjusted odds. Outcomes were adjusted for age, sex, year of the procedure, case urgency, operating time and work relative value unit (RVU).

## Results:

140 666 patients met inclusion criteria, 120 991 were white and 19 675 were AA. A higher percentage of AA children were ASA 2 (73.5 vs 68.2%), white children had a higher proportion of urgent cases (23.2 vs 20.7%) and AA children

had more cases over 250 minutes (11.2 vs 8.8%). Preoperative comorbidities appeared similar; however, AA children had a higher incidence of cardiac (5.3 vs 4.5%) and chronic lung disease (1.6 vs 0.9%) compared to white patients. White children had a higher prevalence of sepsis (14.5 vs 12%) and childhood malignancy (1.9 vs 1.4%).

30-day mortality was significantly higher in the AA group at 0.07% vs 0.02% (corrected OR 3.48 (95% 1.76-6.87)) with absolute numbers of 13 and 23 in the AA and white patients respectively. Secondary outcomes were also significantly higher in the AA group with composite complications 16.9% vs 13.8% (cOR 1.27 (95% 1.22-1.32)) and SAEs 6.17 vs 5.17% (cOR 1.08 (95% 1.02-1.15)). Adjusted outcomes were similar and all significantly higher in the AA group.

### **Validity of Results:**

This is a well-designed study that collected over 140 000 patients with only 2 patients being excluded for incomplete data. Risk of bias for outcomes is low given that outcomes were mainly objective. Follow up data to postoperative day 30 is adequate to capture the majority of postoperative complications. Their results were statistically significant and given the large sample size is likely to represent an important trend. However, the absolute number of their primary outcome is low which may lead to overfitting of the logistic regression model.

The lack of socioeconomic and hospital data is a limitation. In the US healthcare system this can have especially dramatic effects and may in part explain differences in outcomes. Some baseline medical characteristics (for example, asthma) were not specifically recorded. A potential confounding factor is the complexity and variability of assigning race when not self-identified and how multiethnic patients would impact results.

### **Generalizability of Results:**

The results of this paper were similar to other studies done in the adult and pediatric surgery populations which have shown differences in outcomes between AA and white patients. There is some data in emergency medicine literature which has shown a difference in care in the emergency department based on race, however unfortunately there are no high-quality studies which have investigated this in Canada.

While there are limitations in applying the results of this paper directly to our practice in emergency medicine, there are important themes that may apply to our practice. It is possible that a difference in treatment or outcomes of patients in the emergency department exists between various racial groups in Canada. Further qualitative and quantitative research is needed to answer this question in our local population.

### **The Bottom Line:**

This retrospective cohort study demonstrates a significant difference in postoperative morbidity and mortality based on race.