

Early Mortality Following Neonatal Circumcision in the United States

Alexandre T Rotta, MD, FCCM, FAAP¹, Veerasathpurush Allareddy, BDS, MBA, PhD² and Veerajalandhar Allareddy, MD, MBA, FAAP, FACP¹

(1)Rainbow Babies & Children's Hospital, Cleveland, OH, (2)The University of Iowa, Iowa City, IA

Purpose: Non-therapeutic circumcision is the most commonly performed surgical procedure in the United States and the only where a healthy and functional anatomical part is removed without the individual's expressed consent. Controversy exists regarding the balance between proposed benefits and harm from circumcision, owing to, at least in part, a paucity of data describing serious complications associated with the procedure. We conducted this study to quantify and characterize early mortality and its associated factors in patients who underwent neonatal circumcision in the United States.

Methods: We performed a retrospective analysis of all patients who underwent circumcision while hospitalized during the first 30 days of life from the years 2001 to 2010 using the National Inpatient Sample (NIS). The NIS is the largest publicly available all-payer inpatient health care database in the United States, yielding national estimates of hospital inpatient stays. Weighted data from the NIS estimates more than 36 million hospitalizations nationally with data drawn from 44 States representing more than 95% of the U.S. population. Multiple patient and hospital level factors were analyzed with descriptive statistics relative to early mortality as the outcome of interest, defined here as deaths that occurred during the primary admission. The present study was considered exempted by our Institutional Review Board.

Results: Over the course of 10 years, there were 200 early deaths among 9,899,110 subjects who underwent circumcision (1 death in every 49,166 circumcisions). Compared to survivors, subjects who died after circumcision were predominantly white (63.9% vs 68.2% among survivors), treated at large bed size hospitals (59.6% vs 62.6% among survivors) located in the South (33.8% vs 28.9% among survivors) or the Midwest (33% vs 36.1% among survivors), and funded by private insurance (52.1% vs 61.4 among survivors) or Medicaid (39.7% vs 31.7% among survivors). Subjects who died were more commonly treated at teaching hospitals (80.1% vs 49.9% for survivors, $p < 0.001$). Subjects who died were also more likely to have associated co-morbid conditions, predominantly coagulopathy (8% vs 0.06% among survivors), and fluid and electrolyte disorders (23.2% vs 0.5% in survivors).

Conclusion: In this large national cohort of infants who underwent circumcision in the first 30 days of life, the risk of early death is not insubstantial. Infants circumcised in teaching hospitals had a significantly higher risk of mortality compared to their counterparts, as did subjects with coagulopathy or fluid and electrolyte disorders. Advance recognition of these factors could lead to a decision to forgo the procedure, or at least inform the discussion of potential benefit versus harm between the physician and the consenting parent.