IMPACT OF RBC TRANSFUSION VOLUME ON POSTOPERATIVE COMPLICATIONS AND MORTALITY IN INFANT SURGERY

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Background: Red blood cell transfusion (RBCT) is commonly used as resuscitative fluid in infant and neonatal surgical care. However, the association between total RBCT volume and postoperative outcomes in infants and neonates is not well characterized.

Materials/Methods: National cohort study of patients <1 year old within the National Surgical Quality Improvement Program–Pediatric database who underwent inpatient surgery (2012-2016). All patients who received perioperative RBCT were stratified using weight-based RBCT volume: <20cc/kg, 20-40cc/kg, and >40cc/kg (estimated normal blood volume 80 cc/kg). Postoperative complications were categorized as systemic infection, neurologic, renal, pulmonary, and cardiovascular. The association between RBCT volume, postoperative complications, and 30-day mortality was evaluated with multivariable logistic regression. Additional analysis was performed to address possible intraoperative complications resulting in large volume RBCT by excluding intraoperative transfusions.

Results: Among 46,452 infants, 3,865 (8%) received RBCT. Among those who received RBCT, 45% received <20cc/kg, 35% received 20-40cc/kg, and 20% received >40cc/kg. Relative to infants who were not transfused, RBCT volume was associated with a dose-dependent relationship with mortality (<20cc/kg OR 1.52, 95% CI [1.11-2.09]; 20-40cc/kg OR 2.91, 95% CI [2.05-4.14]; >40cc/kg OR 14.16, 95% CI [9.77-20.52]) and certain postoperative complications (Figure). After excluding intraoperative transfusions, RBCT and mortality still demonstrated a dose-dependent relationship (<20cc/kg OR 1.42, 95% CI [0.91-2.21]; 20-40cc/kg OR 2.71, 95% CI [1.27-5.78]; >40cc/kg OR 16.09, 95% CI [8.08-32.04]).

Conclusions: Total RBCT volume is associated with worse postoperative outcomes in infants and neonates. Future prospective studies are needed to delineate the role for liberal versus restrictive RBCT strategies in this age group.

Images / Graph / Table