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The Use of Acute Normovolemic Hemodilution in Pediatric Cardiac Surgery

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Abstract

Background

Acute normovolemic hemodilution (ANH) is considered safe and effective in decreasing perioperative transfusion in pediatric populations undergoing high blood-loss surgeries. We sought to determine the association between ANH and the intraoperative use of allogeneic blood products in pediatric cardiac surgery patients.

Methods

Single-center cohort study including pediatric patients between 0 and 36 months of age undergoing surgical repair or palliation of their cardiac defect with the use of cardiopulmonary bypass between November 2013 and November 2014. Our primary endpoint was the volume per kilogram of body weight of any blood product administered. Secondary endpoints were postoperative bleeding, coagulation profile, creatinine, vasoactive support, duration of mechanical ventilation, and hospital stay.

Results

Fifty patients met eligibility criteria and were included. Of those 7 were exposed to ANH, while 43 patients were treated according to usual care. Baseline characteristics were similar in both groups. After adjustment for baseline characteristics including age, American Society of Anesthesiologists (ASA) classification, and Risk Adjusted Congenital Heart Surgery score, ANH was associated with reduced administration of allogeneic blood products, with the mean difference between groups of 57.5 mL/kg (95%CI:34.8,80.2). The ANH group had lower blood losses at 6 and 24 hours postoperatively. There were no differences in the duration of ICU or hospital stay.

Conclusions

We found a reduction in the administration of blood products and lower postoperative blood losses associated with the use of ANH in pediatric cardiac surgery patients. The data

suggest that ANH might be beneficial in reducing perioperative morbidity in this patient population.