Efficacy of Cell Salvage in Neonates and Children Undergoing Cardiac Surgery

William N. Stevens, BS, Joseph P. Cravero, MD, Sean Sinnott, BA, David Zurakowski, PhD, James A. DiNardo, MD, David Faraoni, MD, PhD

Department of Anesthesiology, Perioperative and Pain Medicine, Boston Children’s Hospital, Boston, Massachusetts.

Introduction

Studies suggest that inappropriate use of cell salvage techniques to reduce exposure to allogeneic red blood cell (RBC) transfusion in cardiac surgery patients is associated with increased incidences of thrombocytopenia, bleeding, and non-RBC transfusion (1). Neonates and children undergoing cardiac surgery are at higher risk for increased perioperative bleeding and blood product transfusion requirement (2). Limited evidence supports the use of cell salvage to reduce allogeneic RBC transfusion in these populations undergoing cardiac surgery.

Methods

We performed a retrospective medical chart review to study all neonates and children who underwent cardiac surgery with cardiopulmonary bypass between January 2013 and December 2014 at Boston Children’s Hospital. Neonates and children were separated into a cell salvage group (post-January 2014, N=730), and a control group (pre-January 2014, N=498). Primary endpoints included the incidences of allogenic RBC, cryoprecipitate, and platelets transfusion occurring within 48 hours after CPB. We used uni- and multivariate logistic regression analysis to assess the effect of cell salvage on the odds of blood product transfusion.

Conclusion

The use of cell salvage in neonates and children undergoing cardiac surgery significantly reduced the incidence of allogeneic RBC transfusion. Cell salvage usage in a high risk pediatric population (i.e. age < 12 mo, ASA > 3, RACHS > 3) was associated with a 43% reduction of RBC transfusion without an increase in cryoprecipitate and platelet transfusions.