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Response to Letter "The Influence of Intraoperative Autotransfusion on Postoperative Hematocrit after Cardiac Surgery: A Cross-Sectional Study" by Robert S. Kramer and Robert C. Groom

To the Editor,

We thank Kramer and Groom for their comments concerning our study on the use of intraoperative autotransfusion (IAT) during cardiac surgery with cardiopulmonary bypass (CPB). The purpose of this study was to assess the effect of the reinfusion of autotransfusate on perioperative hematocrit drift between CPB initiation and entry to the intensive care unit. We controlled for known confounding variables normalized by body surface area (BSA) into five cohort groups, which provided the evidence and analysis to build our model. The results demonstrated a positive slope trajectory of hematocrit correlating to greater increases in red cell recovery in the immediate postoperative period. Our results show a 0.0045% increase in positive hematocrit drift per mL/m^2 BSA, thus estimating a predicted increase in hematocrit of 3.6% points (1).

The use of IAT during cardiac surgery with CPB has been shown to lower the risk of allogeneic red blood cell transfusion, attenuate the inflammatory response, and reduce the risk for cerebral lipid microembolism (2–6). The Society of Thoracic Surgeons 2011 Guidelines recommend the use of cell salvage with centrifugation IAT as an effective component in blood management and routine intervention during cardiac surgery with CPB (Class I, level of evidence A), yet, during CPB, the supporting data for its use is less clear (Class IIb, level of evidence C). The processing of residual CPB blood is another means of reducing transfusion risk with both ultrafiltration and centrifugation techniques, better alternatives than reinfusing non-processed CPB blood (7).

Although it is well known that the use of IAT removes plasma and platelets from the autotransfusate, this effect has not been shown to negatively influence outcomes during routine cardiac surgery, where excessive blood processing has not been encountered (8). Nevertheless, we have previously published a 330% increase in plasma proteins and a 2.7 fold increase in fibrinogen when ultrafiltration of the waste IAT product was used in an experimental model (9). It is not inconceivable that either the salvage of proteins might benefit select patients who are at an increased risk for coagulation disturbances or hypoprotienemia. Whether this affects the cellular architecture, including the glycocalyx, remains to be determined.

The value of registry data has been previously reported and is a well accepted means for generating hypotheses that can be pursued through more rigorous scientific methodology. Our study used the SpecialtyCare Operative Procedural rEgistry and included data from 84 centers representing a cross-section of American hospitals where adult cardiac surgery is performed. To our knowledge, this is the largest study to date on the use of IAT to evaluate postoperative hematocrit in non-red blood cell–transfused patients. The methodology for this study did not include an investigation of blood loss and transfusion rates as end points in the postoperative setting, but we agree that these metrics are also valuable end points.

The use of IAT, its effect on hematocrit drift, and recovery may provide team members with an additional bit of information to include in determining the timing of allogeneic red blood cell transfusion.

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