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The Influence of Intraoperative Autotransfusion on Postoperative Hematocrit following Cardiac Surgery: A Cross-Sectional Study

RESEARCH ABSTRACT

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Purpose

Utilization of intraoperative autotransfusion (IAT) during cardiac surgery with cardiopulmonary bypass (CPB) has been shown to reduce allogeneic red blood cell transfusion. Previous research has emphasized the benefits of using IAT in the intraoperative period. The present study was designed to evaluate the effects of using IAT on overall hematocrit (Hct) drift between initiation of CPB and the immediate postoperative period.

Methods

We reviewed 3,225 adult cardiac procedures occurring between February 2016 and January 2017 at 84 hospitals throughout the United States. Data were collected prospectively from adult patients undergoing cardiac surgery with CPB, and stored in SCOPE, the SpecialtyCare Operative Procedural Registry™. Patients receiving allogeneic transfusion and those with missing covariate data were excluded from analysis. The effect of IAT volume returned to patients on the primary endpoint, hematocrit change from CPB initiation to intensive care unit (ICU) entry, was assessed using a multivariable linear mixed effects regression model controlling for patient demographics, operative characteristics, surgeon, and hospital.

Results

Descriptive analysis showed greater positive hematocrit change with increasing autotransfusate volume returned. Those patients with no IAT volume returned saw a median hematocrit change of +2.00% while those with more than 380mL/m²BSA had a median Hct drift of +5.00% ($p < 0.001$). After controlling for known confounds, our regression estimate of the effect of IAT volume returned upon Hct drift was +0.0045% per

1mL/m² BSA ($p < 0.001$). For a patient with the median autotransfusate volume returned (273mL/m² BSA), and all other covariate values at their respective medians, this translates to a predicted hematocrit change of +3.6% (95%CI +3.1 to +4.1).

Conclusions

These findings lend further support to the notion that autotransfusate volume is positively associated with increases in postoperative hematocrit.