INTRODUCTION

Blood transfusion with major elective cardiac surgery is substantial and often complies with perioperative transfusion with allogeneic or autologous blood.

Specific risks associated with allogeneic blood transfusions include the transmission of blood-borne infections and immunomodulatory effects.

Extravascular and epistemological observations indicate that allogeneic blood transfusion may be associated with an increased prevalence of postoperative infections.

A number of adjuvant blood options are potentially reduce or eliminate the need for allogeneic blood.

The study compared the infection rate associated with blood management techniques in patients undergoing cardiac surgery where blood transfusion was not administered.

OBJECTIVE

To assess the perioperative infection rates in patients undergoing major cardiac surgery utilizing allogeneic versus autologous blood management and to evaluate post-discharge outcomes.

METHODS

STUDY DESIGN

Observational, unbalanced sampling design study conducted at seven community hospitals.

Standard data collected in form used to record demographic information, pre-existing medical condition history (categorized by cardiovascular, gastrointestinal, hematologic, allergic, hematologic, endocrinologic, social factor, respiratory, neurologic, surgical, and other), medical history, medication history, perioperative times, and surgical anesthetic procedures, blood transfusion and volume replacement information, and perioperative infections.

Telephone calls made by a nurse using 1500-patient days post discharge from the hospital involving identifying the following information from the patient occurrence of an infection, antibiotic prescription, blood transfusion, resuming of activities, activity level, independence scale, fatigue scale, and quality of life.

Protocol received IRB approval and informed consent was obtained prior to patient enrollment.

EXCLUSION CRITERIA

- Inpatient surgeries, including coronary artery bypass graft, replacement of any heart valve (with prosthesis/tissue graft), and thoracic vessel resection with replacement.
- Allogeneic: transfusion of donor-supplied red blood cells, plasma, platelets, or other products.
- Age < 18 years, immunocompromised from current malignancy, systemic viral infection, tumors requiring multiple surgeries, or incompetent to provide consent.

BLOOD MANAGEMENT DEFINITIONS

- Allogeneic blood transfusion was associated with an increased risk of infection during hospitalization for cardiac surgery, but was not observed in patients surveyed 30 days after discharge.

Clinical Outcome: Postoperative Infection Rate

Infections included pneumonia, sepsis, UTI, hospital-acquired/other infection, deep surgical wound infection, septic shock, and cardiovascular infection (all as defined by CDC), and other infections defined by the primary investigator that occurred between the time of surgery until 30 days post hospital discharge.

Statistical Methods

- Blood management comparisons were performed using chi-square or Fisher exact test for categorical variables, and tests on Wilcoxon rank-sum tests for continuous variables.
- Multiple logistic regression analysis to determine the effect management technique and other patient factors on postoperative infection risk.
- Univariate models: factored into included demographic factors, preventing medical conditions, blood management technique.

RESULTS

- Data were obtained from 455 patients. There were 251 and 204 patients in the allogeneic and other groups respectively. The mean (SD) age was 69 (13) years, 75.3% were males, 81% were Caucasian and 59% had postoperative infection rate during hospitalization was 13.3%.

CONCLUSIONS

- The overall risk of postoperative infection in patients undergoing cardiac surgery with estimated blood loss of >1000 mL was 13.3%.
- Allogeneic blood management was shown to double the risk of postoperative infections during hospitalization after adjusting for age, gender, ASA class, and pre-existing medical conditions such as diabetes, hypertension, and end-stage renal disease.

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