INTRODUCTION

- Blood loss with major elective surgery can be substantial and often requires perioperative transfusion with allogeneic or autologous blood.
- Specific risks associated with allogeneic blood transfusions include the transmission of blood-borne infections and immunomodulatory effects.
- Experimental and epidemiologic observations indicate that allogeneic transfusions are associated with an increased prevalence of postoperative bacterial infections.
- A number of autologous blood options can potentially reduce or eliminate the need for allogeneic blood.

This study compared the infection rates associated with blood management techniques in patients undergoing cardiac and orthopedic surgeries where anticipated blood loss exceeded 1000 mL.

METHODS

Study Design
- Observer-blinded, sequential sampling design study conducted at nine community hospitals.
- Standard data collection from electronic medical information, pre-existing medical condition/risk factors, laboratory data, and medical history, evaluation history, preoperative times, medical/surgical procedures, postoperative infection and volume replacement procedures, blood transfusion and volume replacement procedures, infection and perioperative infections.

RESULTS

- Observational, sequential sampling design study conducted at nine community hospitals.
- There were 415 and 1074 patients in the allogeneic and non-allogeneic groups, respectively. The mean (SD) age was 65.6 (11.7) in orthopedic patients and 65.4 (11.7) in cardiac patients.

Blood Management Techniques
- Allogeneic transfusion of damaged, transfused red blood cells, platelets, or volume replacement without receipt of other blood management techniques.
- Autologous blood transfusion or plasma, platelets, or volume replacement with or without receipt of other blood management techniques.

Clinical Outcome: Post-Operative Infection Rate

- The relative risk (95% CI) of postoperative infection was 3.6 (2.4, 5.4) times greater in the allogeneic group. When evaluated by surgery type, the relative risk of infection with allogeneic transfusion (95% CI) was 1.9 (0.8, 4.8) in orthopedic patients (p=0.164) and 1.9 (1.1, 3.1) in cardiac patients (p=0.014).

Blood Management Technique
- Allogeneic
- Autologous
- Other

Statistical Methods
- Statistical analysis performed using SAS/STAT software.
- Blood management care processes performed identically or similarly in both groups for continuous variables.
- Logistic regression analysis assessed influence of blood management technique and other patient factors on postoperative infection risk.
- Statistical significance was defined as p < 0.05.

CONCLUSIONS

- Allogeneic blood management was shown to significantly increase the risk of postoperative infections.
- Other factors identified that significantly influence the risk of infection were surgery type, patient age, and medical disease.
- Cardiovascular surgery and advancing age were associated with a higher probability of postoperative infection. Renal disease may be a surrogate for baseline susceptibility to infection.

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Figure 1: Frequency Distribution of Blood Management Technique Stratified by Postoperative Nosocomial Infection

Figure 2: Frequency Distribution of Surgery Type Stratified by Postoperative Nosocomial Infection

Figure 3: Final Logistic Regression Model for Postoperative Nosocomial Infection by Surgery Type and Blood Management Technique