



STS Press Release

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Red Blood Cell Transfusion in Cardiac Surgery May Increase Risk of Infection

Use of platelets during transfusion does not appear to carry the same risk

Chicago – The risk of postoperative infection appears to increase when patients receive red blood cell (RBC) transfusion during or after cardiac surgery, and greater attention to practices that limit red blood cell use could potentially reduce the occurrence of major postoperative infections, according to a study published in the June 2013 issue of *The Annals of Thoracic Surgery*.

The study, conducted by the Cardiothoracic Surgical Trials Network sponsored by the National Institutes of Health and the Canadian Institutes of Health Research, enrolled 5,158 adult cardiac surgery patients between February and September 2010 to examine the relationship between transfusion and risk of major infection following cardiac surgery.

“Our study enrolled a large population of patients from a number of different institutions who were undergoing any type of cardiac surgery,” said lead author Keith A. Horvath, MD, from the National Heart, Lung and Blood Institute in Bethesda, Md. “This large patient set enabled us to better examine the relationship between transfusion and infection in a very diverse population. However, because this is an observational study, the reported associations cannot be considered causal.”

Key Points

- Although believed to be lifesaving, blood transfusion during cardiac surgery can carry adverse risks.
- Each RBC unit transfused was associated with a 29% increase in unadjusted risk of major infection.
- Cardiac surgery teams should embrace transfusions/blood management guidelines, and all surgical benefits and risks should be discussed between the patient and the surgical team.

Among the patients in the study, RBCs were transfused in 2,481 (48%), and platelets were transfused in 1,599 (31%). The highest volume of RBCs was given during transplant or left ventricular assist device implantation (84%) and thoracic aortic procedures (63%), while the lowest volumes were given for isolated coronary artery bypass grafting surgery (45%) and isolated valve surgery (40%).

Within 65 days following surgery, 235 patients (5 percent) were diagnosed with one or more major infections, the most common being pneumonia, *C. difficile* colitis (bacterial infection in the colon), and bloodstream infections.

The authors found a dose-related association between the quantity of RBCs transfused and the unadjusted risk of infection, with a 29% increase in infection with each RBC unit transfused. Conversely, a lower risk of infection was observed when platelets were also transfused in conjunction with more than four units of RBCs.

“A common problem for many surgeons, and thereby the patient, is how to balance the risk of surgery-induced anemia with the increased risk of infection when using red blood cell transfusion to correct the anemia,” added Dr. Horvath. “Through this study we hoped to shed light on the problem and to encourage hospitals and surgeons to examine cell-salvage techniques and other alternatives to RBC transfusion during and after cardiac surgery.”

Cardiac surgery has the highest consumption of blood products of any field in medicine, with half of patients undergoing cardiac surgery receiving blood products, according to background information in the study. Blood transfusion, while believed to be lifesaving, can carry substantial adverse risks. All benefits and risks of transfusion should be discussed between the patient and the cardiac surgery team, and must be weighed against risks of anemia, which also is associated with adverse outcomes, according to the researchers.

Cardiac Surgery Teams Should Embrace Transfusion, Blood Management Guidelines

In an editorial in the same issue, Bruce D. Spiess, MD, from Virginia Commonwealth University Medical Center in Richmond, commented on the conflicting messages in the medical community surrounding blood transfusion. “Few in regulatory agencies have grasped the complex but real relationships between red cell transfusions, infection ... and readmissions,” he wrote. “We in cardiac surgery/anesthesia/perfusion have led by creating/publishing guidelines for transfusion and blood management, thereby demonstrating a leadership understanding of this important area. Even though the cardiac team leads the way in publishing guidelines a small minority of our colleagues have read and adopted these ‘best practices’.”

Dr. Spiess encouraged surgical teams to work together to mitigate problems resulting from blood transfusions. “Today it is time for all cardiac teams to come together as teams embracing blood management,” he wrote. “The data presented in this issue suggests that by doing so not only will cardiac surgery improve patient safety, decrease hospital-acquired infections but they will single-handedly reduce critical blood shortages.”

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Editor’s Note: STS guidelines, including blood conservation guidelines, are available at www.sts.org/guidelines.

For a copy of the study or editorial, contact Cassie Brasseur at 312-202-5865 or cbrasseur@sts.org.

Founded in 1964, The Society of Thoracic Surgeons is a not-for-profit organization representing more than 6,600 cardiothoracic surgeons, researchers, and allied health care professionals worldwide who are dedicated to ensuring the best possible outcomes for surgeries of the heart, lung, and esophagus, as well as other surgical procedures within the chest. The Society's mission is to enhance the ability of cardiothoracic surgeons to provide the highest quality patient care through education, research and advocacy.

The Annals of Thoracic Surgery is the official journal of STS and the Southern Thoracic Surgical Association.