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News

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Reusing Patient's Own Blood During Heart Surgery May Improve Outcomes *Study supports blood conservation strategy as good medicine*

SAN DIEGO, CA (January 28, 2019) — Patients whose own red blood cells are recycled and given back to them during heart surgery may experience shorter hospital stays and fewer complications than patients who receive donated blood, according to a scientific presentation at the 55th Annual Meeting of The Society of Thoracic Surgeons.

“Intraoperative autologous blood donation—when a patient has blood removed at the beginning of surgery and preserved for his/her own use—is a feasible strategy that can be implemented in many different environments,” said Eric Zimmermann, MD, formerly of New York-Presbyterian Queens (NYPQ) Hospital in New York, now with Oregon Health & Science University in Portland. “Our study shows that heart surgery teams who use this approach can produce better outcomes for their patients.”

Dr. Zimmermann and colleagues examined data from 689 patients who received heart surgery at NYPQ Hospital between January 2009 and December 2017. Because the institution launched a “more aggressive” intraoperative autologous donation (IAD) protocol in January 2013, the data were separated into two groups: Group 1 included 268 patients who received heart surgery “before” the IAD protocol, and Group 2 included 420 patients who had heart surgery “after,” meaning that their own blood was salvaged and given back to them during their surgeries. Emergency surgeries were excluded from the analysis.

KEY POINTS

- Intraoperative autologous blood donation (IAD) is when patients donate blood during surgery for their own use.
- Heart surgery patients may experience shorter hospital stays when their own blood is used during the operation.
- IAD is considered safe, effective, and cost-saving.

The research showed that with the more stringent IAD protocol, the need for blood transfusion decreased from 70% to 40% and the chest tube output was lower, reducing from 1,295 ml to 1207 ml. The chest tube is a drain that is placed at the time of surgery to help remove extra fluids from the patient. A reduced output is notable because it means patients may be able to get moving quicker and leave the hospital sooner. In addition, patients experienced a shorter length of hospital stay, 7.8 days versus 6.8 days.

“The effect of IAD translates to roughly 1 day shorter length of stay,” said Dr. Zimmermann. “This may seem modest but it could have a real effect. I believe that blood conservation may offer significant savings in terms of morbidity and mortality. Importantly, these savings have implications for quality of life after heart surgery and also may translate to cost efficiencies for hospitals and care providers.”

IAD involves a patient's blood being removed at the beginning of surgery and then stored as "whole blood" during the operation. Other than an anticoagulant added to prevent clotting, the blood is physically unmodified. At the end of the surgery, the blood is returned to the patient, with the cells behaving as if they had never been outside of the body. Risks associated with IAD include reduction in circulating red blood cells (causing reduced oxygen carrying capacity) and contamination of blood during storage (bacterial or viral).

According to Dr. Zimmermann, intraoperative blood conservation is not only safe and effective, but it also can be a cost-saving alternative. Blood donated by conventional practices (e.g., patients donating blood weeks prior to surgery and/or the use of donated banked blood) requires extra testing, staffing, and storage fees. As a result, this method carries additional risks and much higher costs than intraoperatively donated blood. "We believe that intraoperative autologous blood donation strikes a reasonable balance between cost and benefit," he said.

Gabriel S. Aldea, MD, of the University of Washington in Seattle, explained that while transfusions following heart surgery remain common, research such as this "conclusively" demonstrates that decreasing transfusions will improve clinical outcomes. "STS, along with surgeon- and physician-led initiatives, continues to highlight and communicate results like these, in addition to offering a broad menu of different options on how to achieve lower transfusion rates, with the goal being a more universal, standard of care acceptance," said Dr. Aldea, who was not directly involved with this research.

It also is important to note that intraoperative autologous blood donation requires buy-in and agreement from many stakeholders, including perfusionists, anesthesia staff, and heart surgeons. "But once all parties are in agreement, the tangible benefits seem to outweigh the upfront effort," said Dr. Zimmermann. "Perfusionists are an especially important part of the team, with their careful accounting of the fluid and blood in and out of the patients who are undergoing heart surgery. Research like this would not be possible without their support."

The American Red Cross reports that more than 36,000 units of red blood cells are needed daily in the United States. In addition, recent data show that up to 50% of heart procedures require blood transfusion, with these operations consuming as much as 15% of the nation's blood supply, according to the most recent clinical practice guidelines from STS and the Society of Cardiovascular Anesthesiologists. Because of this demand, intraoperative autologous blood donation may become a key surgical blood conservation strategy.

"Heart surgery is a field that has remained essentially unchanged since its modernization in the mid-20th century," said Dr. Zimmermann. "If we continue to use similar techniques, we can expect similar results. While autologous blood donation is not a panacea, it may be a cost-effective adjunct that may provide benefit in addition to other quality improvement measures. In our partnership with New York-Presbyterian/Weill Cornell Medical Center, we aspire to be one of the first hospitals in the world to consistently use this method in every open heart operation."

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The other authors of the study were DV Avgerinos, R Zhu, and T Ogami.

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Founded in 1964, The Society of Thoracic Surgeons is a not-for-profit organization representing more than 7,400 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.