Fewer heart surgery patients may have to be exposed to blood transfusions, researchers say

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Credit: American Heart Association

Not as many heart surgery patients may need to be exposed to the potential dangers of blood transfusions, according to a new study that researchers say may change current practice.

About half of all heart surgery patients receive blood transfusions, but until now surgeons and anesthesiologists have lacked strong evidence to guide how low to let blood oxygen levels go before giving transfusions.

Hemoglobin levels indicate how much oxygen can be carried in the blood, and are carefully monitored during heart surgery. When levels drop to a certain level, patients may receive red blood cell transfusions.

But how low to let hemoglobin levels go before starting a transfusion has been controversial, investigators said.

"It's a topic that's been vexing to surgeons and anesthesiologists," said Timothy J. Gardner, M.D., a past president of AHA and medical director of Christiana Care's Center for Heart & Vascular Health in Wilmington, Delaware, who wasn't involved in the study.

The study, presented Sunday at the American Heart Association's Scientific Sessions, looked at two approaches to blood transfusions based on hemoglobin levels: liberal strategies that give patients a transfusion sooner—potentially exposing them to a higher risk of infection and inflammation from blood transfusions—and restrictive strategies that result in fewer transfusions but that might reduce the needed oxygen to body tissues by delaying transfusions.

"The risk [of transfusions] is low, but it's not zero," said the study's lead investigator C. David Mazer, M.D., a professor in the Department of Anesthesia at the University of Toronto in Ontario, Canada. The body's immune system may also react badly to a transfusion, as if it were rejecting a transplant, he said.

The study included 4,860 patients in 19 countries. The average age of patients was 72, and two-thirds were men.

Half of patients were given "restrictive" transfusions when hemoglobin fell below 7.5 grams per deciliter either during surgery,in the intensive care unit or in the hospital ward. The other half got transfusions sooner, under the "liberal" strategy that triggered transfusions when hemoglobin levels fell below 9.5 during surgery or in the ICU, or below 8.5 in the hospital ward.

Waiting to give transfusions until the hemoglobin level reached a lower level didn't appear to be any worse than the liberal approach of giving transfusions sooner. The combined cases of heart attack, stroke, new kidney failure requiring dialysis, or death were roughly the same for both groups—11.4 percent for the restrictive group

compared with 12.5 percent in the liberal group.

Hemoglobin levels can drop due to bleeding during heart surgeries such as bypass procedures, valve replacements and aneurysm repairs. Drops also occur when a heart-lung bypass machine temporarily takes over for the heart during certain surgeries.

An important consideration with blood transfusions is the blood supply, according to the study.

Projections suggest there will be a significant lack of adequate blood supply in the future, according to Frank Sellke, M.D., chief of cardiothoracic surgery at the Lifespan Hospitals in Providence, Rhode Island, who wasn't involved in the study.

The restrictive waiting approach to transfusions could lead to less blood being taken from the blood supply, a cost-saving approach, according to Mazer. Although the researchers did not do a formal cost analysis, Mazer said it has been estimated that the costs associated with each unit of blood is about $1,100—putting the cost difference between the liberal and restrictive strategies for blood in this study alone at about $3 million.

General, orthopedic and heart surgeries use about 20 percent of the U.S. blood supply, according to a 2011 report from the U.S. Department of Health and Human Services. The Society of Thoracic Surgeons reported cardiac surgeries alone use 10 percent to 15 percent of the blood supply.

Yet Gardner said a change to a more conservative transfusion strategy will not significantly impact the nation's blood supply.

Even so, Mazer said he hopes hospitals and medical practices that previously used liberal transfusion strategies will review their blood management practices using the data from this new study.

"It provides the most definitive data that we can transfuse heart surgery patients more sparingly and maintain patient safety and patient outcomes, while saving blood and its associated costs," he said.

Provided by American Heart Association