# Use of fresh red blood cells for transfusions for premature infants does not improve outcomes

October 8 2012

Among premature, very low-birth-weight infants requiring a transfusion, use of fresh red blood cells (RBCs) compared with standard RBC transfusion practice did not improve clinical outcomes that included rates of complications or death, according to a study in the October 10 issue of *JAMA*. The study is being published early online to coincide with its presentation at the AABB (formerly the American Association of Blood Banks) Annual Meeting.

"Although RBC transfusions are used routinely in acutely ill patients, including those in neonatal intensive care units, the clinical consequences of the prolonged storage of RBCs have not been firmly established," according to background information in the article. "In recent years, several observational studies conducted primarily in adults have demonstrated that prolonged RBC storage is associated with increased rates of infection, organ failure, death, and increased lengths of stay."

Dean A. Fergusson, M.H.A., Ph.D., of the Ottawa Hospital Research Institute, Ottawa, Canada and colleagues conducted a study to evaluate whether RBCs stored for 7 days or less decreased serious neonatal illness and death compared with standard blood bank issue. The randomized controlled trial included 377 premature infants with birth weights less than 2.8 lbs. (1,250 grams) admitted to 6 Canadian neonatal intensive care units between May 2006 and June 2011. Patients were randomly assigned to receive transfusion of RBCs stored 7 days or less (n = 188)

vs. standard-issue RBCs in accordance with standard blood bank practice (n = 189). The primary outcome for the study was a composite measure of major neonatal illnesses, as well as death. The primary outcome was measured within the entire period of neonatal intensive care unit stay up to 90 days after randomization. The rate of hospital-acquired (nosocomial) infection was a secondary outcome.

The average age of blood in the fresh RBC group was 5.1 days, compared with 14.6 in the standard RBC group. The average and median (midpoint) volumes transfused were similar in both groups, as were postrandomization cointerventions including modes of ventilation, insertion of lines and catheters, other blood products, and major surgical and diagnostic procedures.

A total of 199 infants (53.0 percent) experienced the composite primary outcome. The researchers found that among infants in the fresh RBC group, 99 (52.7 percent) had the primary outcome compared with 100 (52.9 percent) in the standard RBC group. "The rate of clinically suspected infection in the fresh RBC group was 77.7 percent (n = 146) vs. 77.2 percent (n = 146) in the standard RBC group. Rates of confirmed infections were 67.5 percent (n = 127) in the fresh RBC group vs. 64.0 percent (n = 121) in the standard RBC group. Among confirmed cases, rates of bacterial, fungal, and viral infections were similar between the 2 groups. Major sequelae of infections including rates of pneumonia, meningitis and osteomyelitis [inflammation of bone or bone marrow, usually due to infection] were also similar. The median (midpoint) length of neonatal intensive care unit stay was 77 days in the standard RBC group and 84 days in the fresh RBC group."

"We did not find any clinically meaningful or statistically significant differences and, therefore, the many laboratory changes that occur with prolonged RBC storage may not be as important as once thought," the authors write.

"In conclusion, the transfusion of fresh RBCs did not improve clinical outcomes in high-risk, premature, very low-birth-weight infants. We thus do not recommend any changes to storage time practices for the provision of RBCs to infants admitted to neonatal intensive care."

**More information:** *JAMA*. 2012;308[14]:1443-1451. The article is titled "Effects of Fresh Red Blood Cell Transfusions on Clinical Outcomes in Premature, Very Low-Birth-Weight Infants" and was published online by the *Journal of the American Medical Association* on Oct. 8, 2012.

Provided by JAMA and Archives Journals