Transfusion not always best treatment for anemia, age of stored blood may play a role

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University of Kentucky researchers, including lead author Samy Selim of the Division of Cardiovascular Medicine and the Saha Cardiovascular Research Center, have recently published a paper suggesting that transfusion may not always be the best treatment for hospitalized patients with anemia. Results suggest the age of stored blood may be a factor in negative effects of transfusion.

The paper, "Plasma levels of sphingosine l-phosphate are strongly correlated with haemotocrit, but variably restored by red blood cell transfusions," appeared in a recent edition of the journal *Clinical Science*.

For many years, the traditional treatment for hospitalized patients in the United States who have developed anemia — whether associated with medical illness, surgical procedures or trauma — has been red blood cell transfusion, despite the absence of supporting data in many patient populations.

While still a life-saving measure in emergency situations such as acute bleeding, emerging evidence suggests that transfusions may, in fact, be associated with risk beyond commonly-held concerns of microbial transmission and acute reactions. Researchers are currently trying to understand the mechanism behind this observed deleterious effect of transfusion, which seems to correlate with the duration of storage of blood (blood for transfusion may currently be stored up to 42 days).

Red blood cells carry and deliver an important biologically active lipid

mediator, sphingosine 1-phosphate (S1P), which is required for maintaining the integrity of blood vessels.

In the study, investigators confirmed that individuals with anemia have lower circulating levels of S1P. They found that transfusion to correct anemia does not always restore levels of S1P and the inability to restore S1P may be associated with the age of the transfused blood. Levels of S1P decrease during storage of red blood cells, which may explain why transfusion of older blood is less able to restore S1P levels.

These findings could help to explain some of the reasons that blood transfusions can have adverse consequences. Future efforts may focus on supplementing red blood cells with S1P in an attempt to improve outcomes in transfusion.

Provided by University of Kentucky