

Ratio-based Transfusion and Non-trauma Patients



Researchers at Massachusetts General Hospital (MGH) urge caution in adopting ratio-based transfusion – a practice previously studied only in patients with severe traumatic injuries – in non-trauma patients. Their study published in JAMA Surgery suggests this practice may not benefit patients without traumatic injury.

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"The strategy of giving patients requiring massive transfusion greater amounts of fresh frozen plasma, relative to the amount of red blood cells, has spilled over from trauma patients into unstudied patient populations," explains lead author Daniel Dante Yeh, MD, Division of Trauma, Emergency Surgery and Critical Care in the MGH Department of Surgery. "This may have important consequences, since our results suggest that certain populations may be harmed by this practice."

Massive blood transfusions, defined as transfusing at least 10 units of red blood cells within 24 hours, are given to patients experiencing severe blood loss, often in response to traumatic injuries but also in the context of procedures like cardiovascular surgery or liver transplantation and even in some non-surgical patients. Massive transfusion can include adjustments of the ratios of components – including fresh frozen plasma (FFP), platelets and red blood cells (RBC) – with the goal of improving outcomes.

The MGH study was conducted amid reports that high-ratio transfusion was increasingly being used in massive transfusions given to non-trauma patients, a practice not previously studied in this population. To determine how common that had become and to test the hypothesis that higher ratios of FFP to RBCs were associated with improved survival of non-trauma patients, the researchers analysed data covering all massive transfusions administered at MGH from 2009 to 2012.

Of the 865 massive transfusions administered during the four-year period, 767 were given to non-trauma patients – most often to control bleeding during non-emergency surgery. Overall, the ratios of FFP to RBCs given to patients who did or did not survive were almost identical. Dividing patients into three groups – those receiving high, medium and low FFP to RBC ratio transfusions – revealed no difference in 30-day mortality between groups, including for trauma patients.

The researchers also found that, among general surgery and medical service patients, those receiving high-ratio transfusions had a higher mortality rate than those receiving low-ratio transfusions, while the opposite was found among vascular surgery patients. According to Dr. Yeh, unnecessary FFP transfusion should be avoided as there have been reports linking the use of excess FFP with worse outcomes among patients that required less-than-massive transfusions.

An assistant professor of Surgery at Harvard Medical School, Yeh adds, "Ratio-based transfusion has been studied in trauma patients, most recently in a landmark, multicentre randomised study called the PROPRR trial. Similar studies now need to be performed in non-trauma patients before the approach can be accepted as standard practice here at MGH and elsewhere."

Source: [Massachusetts General Hospital](#)

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