The use of type and crossmatch blood ordering

Particularly in patients undergoing major surgery, blood transfusions can be a life-saving maneuver. Prior to receiving any blood transfusion, however, the recipient's blood type (and other factors) must be checked to ensure that it is compatible with the blood type of the person donating the blood. This test is called a type and crossmatch. Performing a type and crossmatch, however, puts the blood on hold for a specific amount of time and is saved until the crossmatch expires. This means that this saved blood is not immediately available for use in other patients. Performing an excessive type and crossmatch also puts excess burden on the staff performing the test, potentially leads to outdating/expiration of blood, depletes vital blood bank resources, and increases hospital costs. Thus it is important to limit or reducing the amount of crossmatched blood.

Nearly 40 years ago, a protocol was established in order to optimize the use of type and corsmatch – the maximum surgical blood order schedule (MSBOS) - based on the risk of blood transfusion for specific types of operations. At our institution, the preoperative blood ordering transfusion protocol recommends for the type and crossmatch of 2 units of PRBC for patients undergoing a liver or pancreas resections. This recommendation was established based on historical transfusion data and other factors that estimates the risk that a blood transfusion will be needed among patients undergoing these type of operations. A benchmark called a crossmatch:transfusion ratio (the number of units type and crossed compared to the number of units actually transfused) is often used and a value of >2.0 is considered excessive.

To assess surgeon compliance with these protocols, we analyzed all patients who underwent a liver or pancreatic resection between 2010 and 2013 at Johns Hopkins Hospital. Among the 2,629 patients studied, 11,574 units of blood were type and crossmatched. 34.1% of patients received at least 1 unit of blood and 3,611 total units of PRBC were transfused. Our institutional C:T ratio was 2.17 based on the proportion of patients transfused and 3.21 based on the overall number of PRBC units transfused – well above national guidelines. We found that nearly one-half of patients (45.9%) were "excessively" crossmatched among patients who actually needed a blood transfusion and 41.0% of patients were "excessively" crossmatched among patients who never even received a blood transfusion. Through our analysis, we found that patients with multiple medical problems and individual surgeon behavior were the main factors that drove this excessive use of crossmatching.

In conclusion, over 1 in 4 patients received crossmatch orders that exceeded institutional and national guidelines. Surgeons ordering this test appeared to be the most important factor associated with crossmatch variation and excessive crossmatch blood ordering. Our study shows that much improvement is necessary in order to limit the amount of type and crossmatch that is ordered which hopefully will translate into decreased healthcare costs.

Publication

Variation in the use of type and crossmatch blood ordering among patients undergoing hepatic and pancreatic resections.

Ejaz A, Frank SM, Spolverato G, Mavros M, Kim Y, Pawlik TM

Surgery. 2015 Sep 15. pii: S0039-6060(15)00620-0