An audit of plasma transfusion appropriateness and adverse reaction rates in Saskatoon tertiary care hospitals

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Introduction: Inappropriate use of plasma is common. Results of a 2013 plasma utilization audit in Ontario identified that 52% of plasma orders were for inappropriate clinical indications and frequently underdosed. To assess local practice, we completed a plasma utilization and adverse event rate audit in the two largest tertiary care hospitals in Saskatoon, Saskatchewan.

Method: This retrospective, quality improvement manual chart audit included all patients who received fresh frozen plasma and frozen plasma (collectively *plasma*) between January and September 2017 at Royal University Hospital and St. Paul's Hospital. Data collected included: patient demographics, indication for plasma transfusion, dose administered, coagulation parameters pre- and post-transfusion, and documented adverse transfusion reaction. Appropriateness of plasma utilization was judged according to the Ontario Clinical Practice Recommendations for the Use of Frozen Plasma.

Results: A total of 270 patients received plasma transfusion during our study period. Patients undergoing plasma exchange were excluded. Final analysis included 200 adult and 44 pediatric patients who received 891 plasma units during 391 transfusion events. Among adult patients, 50.5% (145/287) of plasma transfusion events were inappropriate, predominantly 26.5% (76/287) for an INR of 1.5 or less. Despite availability of prothrombin complex concentrates, 4.9% (14/287) of plasma transfusion events were for warfarin reversal. Among pediatric patients, 79.8% (83/104) of plasma transfusion events were inappropriate, predominantly 48.1% (50/104) for hemodynamic support without either coagulopathy or massive hemorrhage. Overall, adult patients received a mean of 2.94 units and pediatric patients received 12 mL/kg per plasma transfusion event. No adverse reactions to plasma transfusion were formally reported to the Transfusion Medicine Lab. However, evidence of transfusion associated circulatory overload was documented in the patient chart following plasma transfusion in 6.0% (12/200) of adult recipients. Of these, 4 patients received plasma for inappropriate indications. There were no adverse transfusion reactions in pediatric patients.

Conclusion: Our study demonstrated inappropriate plasma transfusion in a majority of cases, particularly in the pediatric population. In general, the overall dose administered appears appropriate. Adverse reactions to plasma were clearly under-reported. These results highlight plasma transfusion utilization, and adverse event recognition and reporting as areas of educational need among clinicians.