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Transfusion related anaphylaxis during orthotopic liver transplantation

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Introduction

Acute non-hemolytic transfusion reactions, consisting of both allergic and febrile reactions are common occurring in up to 10.2% of transfused blood products (1), however anaphylaxis, or severe allergic reactions, are rare following transfusion. The incidence of anaphylaxis is more common after the transfusion of plasma containing products with estimations from 1:10,000 – 33,000 units of platelets and 1:29,000 – 50,000 units of fresh frozen plasma (FFP) compared with 1:50,000 – 200,000 units of red blood cells (1, 2). Despite the rare occurrence, the clinical significance of transfusion related anaphylaxis can be severe with 12 reported fatalities over a 5-year span (3). We report a case of FFP related anaphylaxis in a patient anticipating orthotopic liver transplant (OLT) with a unique peri-operative treatment plan.

Case

A 57-year-old male was referred for possible OLT secondary to liver dysfunction and cirrhosis due to ethanol and hematomachrosis. Prior to surgery the patient was transfused with a single unit of apheresis platelets for ongoing thrombocytopenia (platelet count 52,000/cmm) secondary to portal hypertension and splenic sequestration without incident. The patient's pre-operative labs included hematocrit 35%, prothrombin time 18.9 seconds and partial thromboplastin time 42.4 seconds. During the initial surgical encounter, which included significant blood loss, the patient was transfused via rapid infuser a total of 5 units of pRBCs (1750 mL) and 4 units of FFP (1168 mL) resulting in an acute hypotensive response (blood pressure 40/20) and hypoxia (oxygen saturation 70%). The transfusion was stopped. The patient was treated with multiple doses of epinephrine (total 4 grams) and diphenhydramine 25mg. The initial planned OLT was canceled. A chest x-ray was obtained, which did not demonstrate infiltrates or effusions. He remained intubated and was

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transferred to the surgical ICU. The patient clinically improved over the next 24-hours without further intervention.

The patient's clinical presentation of acute hypotension and hypoxia without chest x-ray abnormalities or concern of fluid overload was considered most consistent with an anaphylactic reaction. Given the severity of the reaction, serum IgA was obtained from a pre-transfusion sample and determined to be 248 mg/dL (reference 68–378).

The patient was subsequently re-challenged with plasma (six days following the initial reaction) in preparation for possible second attempt at OLT. In preparation for this challenge he was pre-medicated with oral 50 mg of prednisone, 50 mg of diphenhydramine, and 40 mg of famotidine in preparation for the transfusion. The patient tolerated the complete transfusion of the plasma product (318 milliliters of plasma over a period of 50 minutes), however approximately 15 minutes after completion of the transfusion he developed chills, urticaria, hypotension, dyspnea and chest pain. The patient required intensive support, including epinephrine bolus and infusion, before his breathing returned to baseline and the remainder of his symptoms resolved.

The patient returned to the operating room 15 days following the initial reaction for OLT. Laboratory assessment prior to surgery demonstrated the following: hemoglobin 9.7 g/dL, platelet count 57,000 / μ L, prothrombin time 20.4 sec, partial thromboplastin time 36.5 sec and fibrinogen 224 mg/dL. Prior to his surgical procedure he was treated with 4400mg of fibrinogen concentrate (RiaSTAP[®]; CSL Bering, Marburg, Germany). RiaSTAP[®] was chosen, despite the absence of additional coagulation factors, in an effort to minimize the patient's exposure to human plasma antibodies and antigens that are present in FFP but largely removed during the production process. He was transfused approximately 75 mL washed platelets and 737 mL washed pRBCs. His surgical procedure was without complication; there was minimal bleeding and no transfusion reaction.

Discussion

We present a case of transfusion related anaphylaxis in a patient anticipating OLT. The patient subsequently underwent a successful OLT that was supported by fibrinogen concentrate, washed platelets and washed pRBCs.

Hemostatic control in this patient was both critical and complex. The utility of fibrinogen concentrate has been observed in multiple surgical circumstances, including cardiac, obstetrical and traumatic surgeries, with successful decreased severity of bleeding (4). In addition to fibrinogen concentrate, our patient was supplemented with washed platelets and pRBCs, which has previously been reported during OLT after anaphylaxis to plasma containing blood products (5). The rationale for washing blood products in this was to reduce the amount of any offending allergenic plasma protein(s). The patient demonstrated minimal bleeding throughout the OLT.

Our intervention, aimed at minimizing plasma exposure, was successful in avoiding anaphylaxis during the patient's surgical intervention.

References

1. Stainsby D, Jones H, Asher D, Atterbury C, Boncinelli A, Brant L, et al. Serious hazards of transfusion: a decade of hemovigilance in the UK. *Transfusion medicine reviews*. 2006; 20(4):273–82. Epub 2006/09/30. [PubMed: 17008165]
2. Domen RE, Hoeltge GA. Allergic transfusion reactions: an evaluation of 273 consecutive reactions. *Archives of pathology & laboratory medicine*. 2003; 127(3):316–20. Epub 2003/03/26. [PubMed: 12653575]
3. Administration USFaD. Fatalities Reported to FDA Following Blood Collection and Transfusion: Annual Summary for Fiscal Year 2012. 2013. Available from: <http://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/ReportaProblem/TransfusionDonationFatalities/ucm346639.htm>
4. Warmuth M, Mad P, Wild C. Systematic review of the efficacy and safety of fibrinogen concentrate substitution in adults. *Acta anaesthesiologica Scandinavica*. 2012; 56(5):539–48. Epub 2011/12/14. [PubMed: 22150561]