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Acute hemolytic reaction following an ABO incompatible platelet transfusion

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Introduction: Platelet transfusion is a common clinical practice to achieve and maintain hemostasis in bleeding patients. Due to low plasma volume in platelet units, crossmatch compatibility is not necessary and transfusion of ABO-incompatible platelets is considered a safe practice. However, acute intravascular hemolysis, although very rare, may be encountered in case of transfusion of ABO-incompatible apheresis (single donor) platelets.

Case Report: A 61-year-old female, blood group A, with acute myeloid leukemia required platelet transfusion for chemotherapy-induced thrombocytopenia. She received one unit of irradiated and leukoreduced apheresis platelets from group O donor. Immediately after transfusion, the patient developed chills, body aches and noticed cherry-colored urine. Her vital signs and physical exam were unremarkable except for pallor. Her hemoglobin dropped from 8.1g/dL to 5.5g/dL within 12 hours post-transfusion; total bilirubin increased from 0.8mg/dL to 2.4mg/dL, LDH increased to 1125U/L and haptoglobin was <8mg/dL. Urinalysis showed 3+ hemoglobin and 3-10 RBCs.

Results: Immunohematology workup showed positive tube DAT with polyspecific AHG, negative reactivity with anti-IgG and 4+ reactivity with anti-C3. The patient's red blood cell antibody screen was negative for non-ABO alloantibodies. The donor's specimen testing for anti-A1 antibodies in saline revealed a titer of 1:512 at room temperature. These clinical findings along with laboratory investigations supported the diagnosis of acute intravascular hemolysis due to high anti-A1 titers in the transfused group O platelets.

Conclusion: Although rare, but the possibility of acute hemolytic reaction due to ABO-incompatible platelet transfusions should be taken into consideration, particularly when group O apheresis platelets are being transfused to non-group O recipients. Some proposals to help reduce the risk of hemolytic reactions due to platelet transfusions include: (i) screening of all group O apheresis platelet units for anti-A and anti-B titers, (ii) transfusion of ABO-compatible platelets if possible, (iii) for non-group O recipients, transfuse group O platelets only from donors with undetectable or very low anti-A/anti-B titers (iv) plasma volume reduction of ABO-mismatched apheresis platelet units for non-group O recipients.

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