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Anti-VEL - not detectable but still harmful

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Background

Vel (034/VEL) is a high-frequency antigen. Anti-Vel antibodies may cause severe hemolytic transfusion reactions and hemolytic disease of the newborn. Detection and confirmation of anti-Vel antibodies is challenging due to the lack of Vel negative cells in routine panels, also essential to exclude the presence of other clinically relevant antibodies.

We report a case of an 89-old female patient who suffered from perioperative blood loss. Based on a negative antibody-screening test she received two Vel positive red blood cell concentrates first uneventfully, but subsequently developed a delayed hemolytic transfusion reaction. Ultimately, it turned out that an anti-Vel was already diagnosed in 1998, which was now boostered and caused a delayed hemolysis.

Aims

This case report aims to highlight the challenges of detecting anti-Vel antibodies and the importance of maintaining accurate and comprehensive antibody records, even when the antibody was identified decades ago. It also emphasizes the necessity of a national database for transfusion-relevant blood group antibodies, which can significantly improve transfusion safety and care for patients with rare or uncommon antibodies.

Methods

Direct (DAT) and indirect antiglobulin test (IAT) (ID-system and tube technique, BioRad/Grifols, CH, in-house and SCARF) were applied on samples obtained before and after the hemolytic reaction. Compatibility testing was performed using IAT at 37°C (gel-card and tube test, BioRad, CH). Molecular typing of the patient's blood group antigens including rare antigens was performed by PCR-SSP (inno-train, D). We also conducted a homologous adsorption with donor test cells with patient-matched (but Vel+) profile to exclude or reveal additional alloantibodies. Clinical and laboratory markers for hemolysis were monitored by standard examinations.

Results

Hemoglobin (hb) value at admission (day -1) was 132 g/l and dropped to 58 g/l after surgery (day 2). After transfusion of two Vel positive blood units hb increased to 89 g/l (day 4) and dropped again to 74 g/l (day 6) showing elevated bilirubin, LDH and decreased haptoglobin.
Antibody screen and compatibility testing as well as DAT before transfusion were negative. Antibody identification 9 days after transfusion revealed an anti-Vel reactive in IAT and with papain-treated test cells. After adsorption, two additional antibodies were detected- anti-Jk^a and anti-M, both reactive in IAT. DAT was positive for IgG, eluate remained negative. The patient's predicted phenotype was A, RH:1,2,-3,-4,5, KEL:-1,2,-3,4, FY:1, MNS:-1,2, LU:-1,2, VEL:-1.
With the onset of hemolysis, three Vel negative red blood cell units were ordered and could be provided in a timely manner thanks to the collaboration with the Swiss National Rare Donor File. Two of the three performed cross matches turned out positive, because of Jk^a positivity.

Conclusion

Physicians and patients need to be aware about the importance of correct information of alloantibodies even if the detection dates back decades and they are below the detection limit.

Thus, this case raises the question of the necessity of a national database for transfusion-relevant blood group antibodies, ensuring the best possible transfusion medical care of the patient. Fortunately, in our case, hemolysis was stabilized without further need for transfusions.