Case Report: A Rare Case Of Anti-Jk3 Alloimmunization In Pregnancy

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1. Background

- Kidd blood group was discovered in 1951 following a fatal case of erythroblastosis fetalis.
- Three Kidd phenotypes - Jk(a+b+), Jk(a+b-), and Jk(a-b+) are common, with the null phenotype Jk(a-b-) being rare with a reported incidence of 0.9% in Polynesians. (1)
- Individuals with Jk(a-b-) phenotype can produce antibodies against Jk3 antigen, which is present in 99% of population, complicating search for compatible blood products.
- Due to its rarity, cases describing management of anti-Jk3 antibodies during pregnancy are limited.

2. Objectives

- To describe the successful management of a pregnancy complicated by anti-Jk3 antibodies.

3. Case

- 34-year-old G3P2 with no significant history other than prior caesarean section tested positive for anti-Jk3 antibodies (titre 1:256) during early antenatal screening.
- She had no history of blood transfusion or alloimmunization; all pregnancies had same paternity.
- Maternal phenotype was Jk(a-b-) and paternal was Jk(a-b+).
- Non-invasive maternal cell-free DNA predicted the fetus was Jk3 antigen-positive.
- Fetal MCA PSV was monitored from 19 weeks.
- Lifeblood has limited Jk(a-b-) donors, and Jk3-negative blood product are rare in Australia. Blood management plan was developed focusing on avoiding anaemia, minimise blood loss and transfusion planning.
- At 26 weeks, elevated MCA PSV and rising antibody titres (1:2048) indicated significant fetal risk.
- Fetal blood sampling revealed low haemoglobin (73 g/L), positive DAT and high reticulocyte counts (4.5%), prompting intrauterine transfusion(IUT) with 85ml of Jk3-negative O-positive red blood cells.
- Post-IUT, fetal haemoglobin improved to 145 g/L.
- Although antibody titre rose to 1:4096, ultrasound surveillance demonstrated stable fetal condition.

4. Results

- A uncomplicated elective caesarean section at 36 weeks resulted in a healthy baby (approximately 3500g).
- As predicted, the neonate's blood has anti-Jk3 antibodies present; with red cell phenotype of Jk(a-b+).
  Haemoglobin level was 144 g/L.
- The neonate required phototherapy but did not need transfusion or IVIT.

5. Conclusion

- We describe the first case of fetal anaemia requiring early IUT due to the rare anti-Jk3 antibody.
- Interestingly only a single IUT was required despite increasing maternal anti-Jk3 antibody titres.
- Difficulty in sourcing blood products for fetal or maternal transfusion were encountered.
- Multidisciplinary involvement of maternal-fetal medicine, neonatology, haematology and transfusion service allowed successful management of this rare case of anti-Jk3 antibody-mediated fetal alloimmunization.

References

1. Lawicki S, Covin RB, Powers AA. The Kidd (JK) blood group system. Transfusion Medicine Reviews. 2017;31(3):165-72.

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