

Alloimmunization in Pregnancy

Priya Shenwai; Manjusha Kuraganti; Maritza Luna Marin; Allison Kalstein-Apple; Joel Yarmush
New York Presbyterian Brooklyn Methodist Hospital, Anesthesiology, Brooklyn, NY, USA,

INTRODUCTION

Antibodies against any of the Kidd antigens are known to cause severe hemolytic transfusion reaction, especially delayed hemolytic reactions (DHTRs) and occasionally hemolytic disease of the fetus and newborn (HDFN). Hemolytic disease of the fetus and newborn is a condition characterized by destruction of the fetus red blood cells via transplacental transmission of maternal alloantibodies. Majority of cases are due to ABO incompatibility or anti-D antibodies. However, kidd system antibodies are usually of IgG type, thus have the ability to cross the placenta and destroy the fetal red blood cells causing mild to severe HDFN as well.

CASE PRESENTATION

- We present a 28-year-old G4P2012 with a history of pan agglutination.
- She had rare antibodies (O+, K+, Jka, Jkb, S+, S-, Fya, Fyb) due to alloimmunization in previous pregnancy.
- She had uncomplicated two vaginal deliveries which did not require any transfusions.
- She was followed closely by a multi-disciplinary team comprising obstetricians, Maternal Fetal Medicine specialist, hematologist, blood bank team, and anesthesiology teams throughout her pregnancy.
- The patient was educated and counseled extensively about the presence of antibodies and its implications.
- She was explained about severe hemolytic anemia and associated risk of fetal mortality, as is seen with Kell antibodies.
- She was medically optimized to improve hemoglobin levels, consented for autologous transfusion, and use of cell saver if needed, while attempts to obtain compatible blood was ongoing.
- She had a normal vaginal delivery at 39 weeks with minimal blood loss of 150 ml and did not require any transfusions.

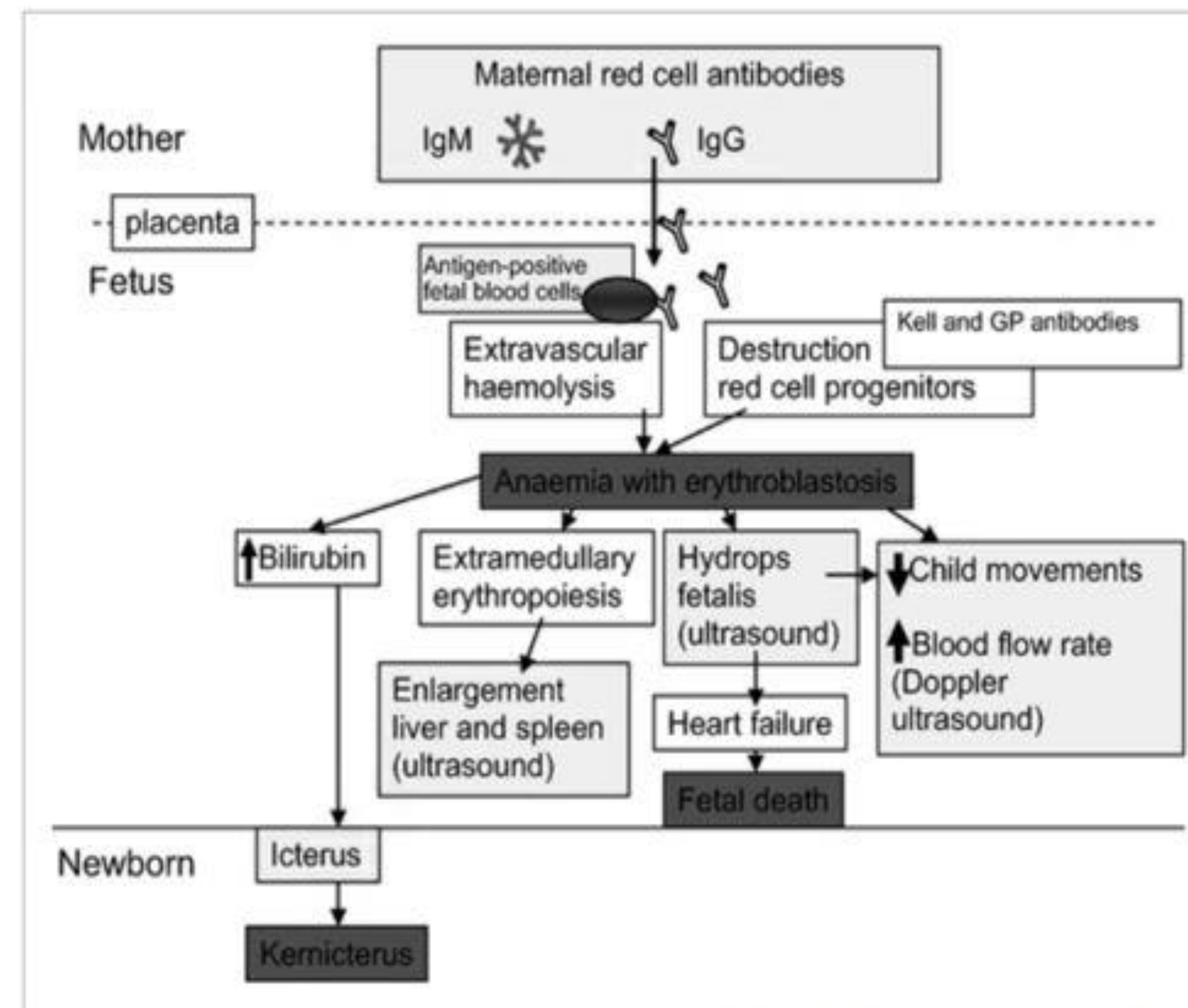


Figure illustrating the pathogenesis of hemolytic disease of the fetus and newborn in the mother, fetus, and newborn.

DISCUSSION

- Alloimmunization is an immune response to foreign antigens after exposure to genetically different cells or tissues.
- It may be a natural event during pregnancy, but frequently it is an undesirable outcome of blood transfusion.
- The “type and screen” (T&S) is the first step in determining donor/recipient compatibility and it has three different tests.
- The T&S determines the ABO blood type of the patient, determines the Rh blood type of the patient (if D antigen is present or not), and screens the patient for any non-ABO antibodies that may have developed against donor red blood cells.
- When clinically significant antibodies are detected additional testing is performed.
- Management of pregnant patients with such antibodies includes early detection by screening, identification of subtypes, and quantification of antibody levels.
- For patients with high titers or Kell alloimmunization, serial ultrasound monitoring of middle cerebral artery peak systolic velocity (MCA-PSV) and search for signs of hydrops fetalis is helpful.
- The strategies to optimize such patients focus on enhancing iron levels by supplementation, autologous blood transfusion, donation from siblings, cell salvage, and multidisciplinary meetings with Obstetrician, hematology, blood bank, and anesthesiology teams.
- Multidisciplinary care approach is the key to successful outcomes.

CONCLUSION

Alloimmunization with presence of anti-K antibodies lead to severe hemolytic anemia with high fetal morbidity and mortality.

A multidisciplinary team approach is pivotal in managing obstetric patients with rare antibodies.

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