Treatment of Rh D Alloimmunization in Pregnancy with Therapeutic Plasma Exchange and IVIgG: Two Cases at an Academic Center

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Background: Hemolytic disease of the fetus and newborn (HDFN) can occur when an Rh D-negative female with an anti-D alloantibody is pregnant with an Rh D-positive fetus. Maternal sensitization often occurs during a previous pregnancy with an Rh D positive fetus after maternal-fetal hemorrhage, but can occur after transfusion of red blood cells expressing Rh D. The effects of HDFN are catastrophic, including fetal demise, fetal hydrops, and kernicterus. The mainstay of treatment for fetal anemia to prevent fetal hydrops is intrauterine transfusion (IUT). Transcranial middle cerebral artery (MCA) ultrasounds are the gold standard test for fetal anemia. MCA measurements more than 1.5 multiples of the median (MoM) predict moderate – severe fetal anemia, and IUT is indicated. IUT is dangerous before 20 weeks gestation age (WGA), and therapeutic plasma exchange (TPE) and IVIgG can be employed to delay the onset of fetal anemia until IUT can be safely performed.

Case Report: Two Rh-alloimmunized pregnant patients are described. The first patient was a 28 year old female, G4P1112, with an initial anti-D titer of 1:128 in her first trimester. TPE three times per week, and IVIgG twice per week were initiated at 20 WGA. Her prenatal course was complicated by a central line infection requiring line replacement. She also developed a pulmonary embolus and was anticoagulated with enoxaparin. TPE and IVIgG continued until 37 WGA, when the patient underwent scheduled caesarean delivery of a viable female. During pregnancy, the patient's anti-D titers ranged from 1:32 to 1:512. Her MCA velocities peaked at 1.22 MoM, and the infant was never transfused.

The second patient was a 28 year old female, G5P2, with anti-D and anti-C alloantibodies. The initial anti-D titer was 1:2048, and anti-C was undetectable. TPE and IVIgG were initiated at 11 WGA, and TPE continued until 25 WGA. The patient's anti-D titers ranged from 1:256 to 1:2048. The fetus received four IUT's due to rising MCA velocities, the first at 22 6/7 WGA. The patient underwent urgent caesarean delivery of a viable male at 30 WGA.

Conclusion:

Due to the widespread use of prophylactic Rh immune globulin doses in pregnant women who are Rh D-negative, the incidence of HDFN has decreased dramatically. As a result, the recent literature addressing management of pregnant women with Rh alloimmunization and HDFN consists of case reports and small case series. Published treatment regimens utilize TPE and IVIgG not to prevent HDFN completely, but to delay IUT as long as possible, particularly until after 20 WGA, before which IUT is too risky to attempt. Our experience treating these two patients is concordant with the recent published case reports, and supports TPE and IVIgG as a safe and effective adjunctive therapy in Rh alloimmunized pregnant women.