Case Report

Rh Alloimmunization and Term Delivery

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Nowadays management of severe Rh alloimmunization consists of serial determination of middle cerebral artery peak systolic velocity, amniocentesis, cordocentesis, and in many instances intrauterine transfusion. We present a case of severe Rh alloimmunization who, for the first time in Iran, was delivered at term after several intrauterine transfusions.

Keywords: Alloimmunization • intrauterine transfusion • term delivery

Introduction

Despite the widespread use of antenatal and postpartum Rhesus factor immune globulin (RhIG), red blood cell (RBC) alloimmunization still occurs in pregnancy. This is mainly because of inadvertent omissions in administration, antenatal sensitization prior to RhIG dose that should be administered at the 28th week of gestation, or lack of immunoglobulins to other RBC antigens.1

Different options for management of Rhesus factor and D antigen (RhD) have been evolved alongside the technologic advances. Serial peak middle cerebral artery velocities using Doppler ultrasound, amniocentesis, or cordocentesis can be used in these pregnancies to detect fetal anemia.

In some situations, intrauterine transfusion (IUT) is necessary. Fetal intraperitoneal transfusion for the treatment of severe RBC alloimmunization was first reported by Liley in 1963. Since then, major advancements have included intravascular techniques,2 that can prolong pregnancy and improve the outcome.

In severely sensitized pregnancy, the risks of continued cord blood sampling and transfusion must be weighed against the potential neonatal morbidity and mortality associated with preterm delivery. This has traditionally led to scheduling the last IUT around the 30 – 32 gestational weeks, and the delivery between 32 – 34 gestational weeks after steroid administration to mothers to enhance fetal pulmonary maturation. To limit the neonatal morbidity, intravascular IUT can be continued up to the 36th week of gestation, and delivery can be postponed to the 37 – 38th weeks of gestation.3

Herein, we present a case of severe Rh alloimmunization who, for the first time in Iran was delivered at term after several IUT.

Case Report

A 39-year-old pregnant woman (gravida 6, para 5) was referred to the Department of Obstetrics and Gynecology, Mirza Kochak Khan Hospital, Tehran University of Medical Sciences, Tehran, Iran in August 2004 at the 20th week of gestation for treatment of Rh alloimmunization. Her first pregnancy ended in a normal delivery at term. Her second term infant was admitted to the neonatal intensive care unit (NICU) for 2 days and died because of hemolytic disease. Her third pregnancy was complicated by intrauterine fetal death (IUFD) with delivery at the 28th week of gestation, while the infant was hydropic at birth. Her fourth pregnancy resulted in a healthy preterm infant after four times intrauterine intraperitoneal transfusion.
The newborn required several exchange blood transfusions in the NICU. In her fifth pregnancy, the infant received exchange blood transfusion for two times because of high bilirubin level.

In her sixth pregnancy, she was referred to us at the 20th week of gestation. Maternal blood type was O, Rh negative, anti-D positive, with a titer of 1:32. Paternal blood type was O, Rh positive. Amniocentesis was performed to confirm fetal anemia. The infant had an optical density (AOD450) of 0.12 (lower portion of zone II of Liley graph). Four weeks later when the patient was visited again in the hospital, amniocentesis was repeated and AOD450 of 0.139 was in the upper 75% portion of zone II of Liley graph.

At the 26th and 28th weeks of gestation, 60 mL, and 80 mL of ultra packed RBC were transfused intraperitoneally, respectively.

At the same time, for maturation of fetal lungs two doses of betamethasone (12 mg/24hr IM) were injected to the mother. At the 31st week of gestation, combined IUT was done; 80 mL of ultra packed RBC was transfused via the umbilical vein and 110 mL of ultra packed RBC was transfused intraperitoneally. The hemoglobin level before transfusion was 8.2 g/dL, but unfortunately the posttransfusion sample was clotted. The final transfusion was done at the 35th week of gestation. One hundred eighty milliliter of ultra packed RBC was transfused into the umbilical vein. The fetal hemoglobin level was 12.3 g/dL before transfusion. During the IUT, the hemoglobin level was 14.4 g/dL and at the end it was 15.2 g/dL. Rapid quantitation of hemoglobin was not available. The second dose of betamethasone were injected to the mother at the 34th week of gestation.

The patient was kept in the hospital until the time of labor. The fetus was assessed by nonstress test and biophysical profile twice a week. In that work-up no sign of hydrops or ascites was detected. The fetus was macrosomic in relation to gestational age (3750 g) and the amniotic fluid was increased (amniotic fluid index = 26 cm) at the 36th week. Screening test for gestational diabetes was negative.

Finally at the 37th week plus 3 days of gestation, pregnancy was terminated. A male fetus weighing 3850 g was born with an APGAR score of 9 at the first minute and 10 at the fifth minute. The cord hematocrit level was 39%, direct bilirubin 5.2 mg/dL, reticulocyte count 2.7%, and direct Coombs test was positive. He required three exchange blood transfusions and was discharged on the 17th day of life.

**Discussion**

Before the introduction of direct intravascular fetal transfusion (IVT), fetuses were routinely delivered at the 32nd week of gestation. Hyaline membrane disease and the need for neonatal exchange transfusions for treatment of hyperbilirubinemia were common. Klumper and colleagues compared perinatal mortality for IUT undertaken before and after the 32nd week of gestation.5 Perinatal loss occurred in 3.4% of the 409 early IUT compared with 1% in the 200 procedures performed after that gestational week. Most experienced centers now perform final IUT at the 35th week of gestation, with delivery anticipated at 37 – 38th weeks of gestation. This practice allows maturation of the hepatic enzyme systems, which virtually eliminates the need for neonatal exchange transfusions.5 – 9

Rh alloimmunization has been managed for more than 20 years in our center. Until 3 – 4 years ago, intraperitoneal fetal transfusion was routinely done and fetuses were delivered at the 34th week of gestation. Thereafter, we have tried IVT, and for the first time a fetus has been delivered at about 38 weeks.

Because of the limited number of NICU beds and the high mortality rate of premature infants in Iran, changing preterm to term labor has great consequences in neonatal mortality.

**References**

