

EMERGENCY CESAREAN SECTION FOR A RARE LIFE-THREATENING FETAL PATHOLOGY

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CASE REPORT

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Abstract

Nowadays, fetal anemia is a rare cause of fetal hypoxia because the widely used ultrasound helps to identify it and makes antepartum management possible. We present a case of a 34-week pregnant woman with Rh incompatibility and alloimmunization associated with severe fetal anemia. In this case, urgent decision was needed to save the life of the fetus. A 24-year-old patient, G5 P2, 34 weeks pregnant, was presented to our emergency room for the lack of perception of active fetal movements for 24 hours. We mentioned that she was known to have Rh incompatibility and the last determination of anti Rh antibodies had a titer of 1:8 at 32 weeks of pregnancy. The ultrasound scan found modified values of the parameters on the middle cerebral artery indicating the presence of fetal anemia according to FMF (Fetal Medicine Foundation) algorithm for prediction anemia with an estimated fetal hemoglobin < 1.5 g/dl. Repeated CTGs indicated the presence of non-reassuring fetal status. An emergency cesarean delivery was decided to save the life of the fetus, which weighed 2600 g, had an Apgar index of 4 and a hemoglobin of 2.8 g/dl. The newborn showed signs of cardiomegaly, hepatomegaly, ascites and hydrops. The evolution of the newborn was favorable and he was discharged 14 days after birth. The ultrasound follow-up of patients with Rh incompatibility and alloimmunization is very important for the timely detection of possible changes in Doppler parameters. In a few cases, severe fetal anemia and non-reassuring fetal status occur, which indicates emergency cesarean section.

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Introduction

The term „cesarean section” has been mentioned in literature since ancient times and was considered to be from the birth of the Roman general, Julius Caesar. In ancient era, cesarean section was practiced to save the life

of the fetus when the mother was dying or had already died. Even if the women survived this procedure, their evolution was unfavorable due to complications such as hemorrhage and infections. In the nineteenth century, progress was noted in cesarean births along with the

development of anesthesia and the improvement of surgical techniques [1].

Even if vaginal birth is a physiological process, there are emergency situations when cesarean birth is necessary to save the mother, the child, or both of them. This type of birth can increase neonatal and maternal morbidity and mortality. In 2021, World Health Organization reported a caesarean birth rate of 21.1%, the highest value being reported in Latin America and the Caribbean (42.8%), and the lowest rate was in sub-Saharan Africa (5 %). It was estimated that in 2030, approximately 28.5% of women worldwide will give birth by caesarean section. This rate was estimated to vary between 7.1% (Africa) and 63.4% (East Asia) [2].

A study that analyzed cesarean birth rates in 28 European countries concluded that in 2019 the cesarean sections rate varied between 16.0% and 52.2%. Compared to 2015, an increase in the rate of cesarean sections was recorded in 12 countries included in the study [3].

The increase in the number of cesarean sections was influenced by a number of non-medical factors, such as financial, cultural and social factors. On the other hand, it is important that women have their first pregnancy at an older age, so they can associate more risks and pathologies. Today's society has changed its perception of vaginal births and thus increased the number of cesarean births on demand [4]. ACOG (American College of Obstetricians and Gynecologists) estimated that cesarean births on demand represent approximately 2.5% of births in the United States [5].

The results of a retrospective cohort study published by Boyle et al. which included 38,484 primary cesarean deliveries showed that in approximately 80% of cases, the indications for cesarean delivery were failure to progress during labor, non-reassuring fetal status and fetal malpresentation [6]. Non-reassuring fetal status refers to the oxygen deprivation of the fetus, which can be

temporary or permanent. This condition can evolve into metabolic acidosis and fetal hypoxia. Non-reassuring fetal status is frequently associated with maternal pathologies (hypertension, diabetes), placental abruption, intrauterine growth restriction, and other obstetrical or fetal conditions. The cardiac activity of the fetus changes when it is deprived of oxygen [7]. The most used method for evaluating heart rate is cardiotocography (CTG) [8]. Fetal hypoxia can have multiple consequences such as injuries to the brain and heart, neurodevelopmental disorders, and intrauterine death can occur if the fetus cannot compensate oxygen deprivation [9]. In current obstetric practice, fetal anemia represents a rare cause for fetal hypoxia. Usually, this can be suspected during ultrasound scans and managed antepartum. There are situations in which fetal anemia is observed for the first time during the intrapartum period and these fetuses have a poor prognosis [10].

We presented a case of a patient with 34 weeks of pregnancy with a special condition and non-reassuring fetal status. We decided an emergency cesarean delivery to save the life of the fetus. The status of the fetus was determined by a rare situation in current practice in which ultrasound became widely used.

Case presentation

A 24-year-old patient, G5 P2, 34 weeks pregnant, was presented to our emergency room for the lack of perception of active fetal movements for 24 hours. The patient had a cesarean section two years ago and three abortions on demand. All pregnancies were achieved with the same partner. We mention that the patient had no other pathologies and this pregnancy was uneventful until the second trimester. The diagnosis of Rh incompatibility was established at 24 weeks of gestation, but without alloimmunization. The patient did not receive the anti-D immunoglobulin vaccine. The patient was evaluated in another clinic and

it was decided to follow the patient through periodic ultrasound scans and blood tests for anti-D antibodies.

The medical documents showed that the patient was hospitalized at 32 weeks of gestation for painful uterine contractions. Blood tests demonstrated the presence of anti-D antibodies with a titer of 1:8. A detailed ultrasound did not suggest the presence of fetal anemia or other signs of fetal distress, the parameters measured at the level of the middle cerebral artery were within normal limits for the gestational age.

At the time of admission, uterine tone was normal and painful uterine contractions were absent. The physical examination noticed a long and closed cervix and no blood or amniotic fluid was found in the vagina.

The patient's blood tests showed the presence of a moderate normochromic normocytic anemia with hemoglobin 8.8 g/dl and no changes due to iron deficiency. The ultrasound scan showed a live intrauterine fetus with cardiomegaly and ascites. The amniotic fluid was in increased amount suggesting mild polyhydramnios, AFI (amniotic fluid index) was 26 cm. The Doppler scan of the middle cerebral artery (MCA) was not satisfactory for the gestational age: PSV (Peak Systolic Velocity) 126.83 cm/s (> 99 th centiles; 2.582 multiple median (MoM)) and PI (Pulsatility index) 1.99 (67th centiles), with estimated fetal hemoglobin < 1.5 g/dl according to The Fetal Medicine Foundation algorithm for prediction anemia (Figure 1).

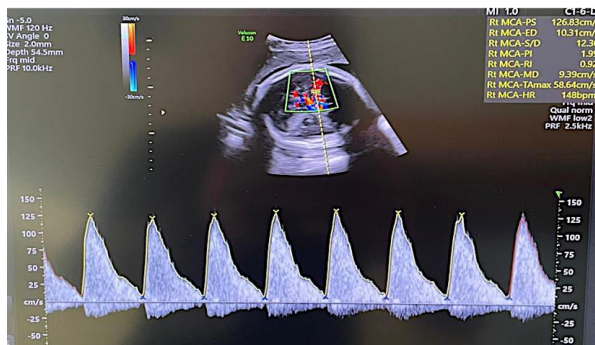


Figure 1 - Doppler evaluation of the middle cerebral artery

The patient was intensively followed and numerous CTGs were performed which showed absence of variability, absence of reactivity, and sinusoidal cardiotocographic pattern (Figure 2). The biophysical profile was performed and a score of 5 was obtained.

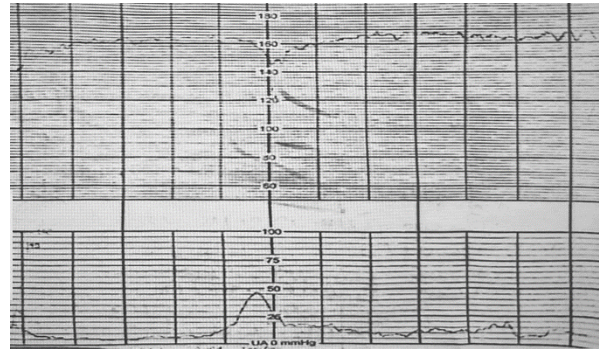


Figure 2 - Cardiotocography

The presence of a non-reassuring fetal status was concluded and considering that the patient had a cesarean section in the past, an emergency cesarean section was decided to save the life of the fetus. In less than an hour after admission, a live female fetus, weighing 2600 grams with an Apgar index of 4, was extracted by caesarean section (Figure 3).



Figure 3 - Extraction of the fetus by cesarean section

The caesarean section was performed safely. No intraoperative incidents and no

significant bleeding were reported. The evolution of the patient was favorable after intravenous iron therapy and antibiotic, analgesic and anticoagulant treatment.

The newborn showed signs of cardiomegaly, hepatomegaly, ascites and hydrops. Blood tests showed severe anemia with a hemoglobin of 2.8 g/dl and a direct positive Coombs test with a titer of 1/800. The newborn required exanguinotransfusion twice and neonatal intensive care. The evolution was favorable and the newborn was discharged 14 days after birth.

Discussions

Rh incompatibility refers to the case when the mother is Rh negative and the fetus is Rh positive. If the mother is exposed to fetal erythrocytes that present the D antigen on the surface, anti-Rh antibodies will be formed. They can cross the placenta to the fetus and can cause the destruction of fetal erythrocytes with the appearance of fetal anemia [11].

Fetomaternal hemorrhage causes the late death of the intrauterine fetus in 1.6% to 11% of cases. Late signs that allow the diagnosis of fetomaternal hemorrhage in utero are the absence or decreased active fetal movements, fetal hydrops and the presence of the sinusoidal pattern on CTG. It is possible that the extent of hemorrhage is not always correlated with the outcome [12]. The Kleihauer-Betke test can be used to assess fetomaternal hemorrhage and estimate the amount of anti-D immunoglobulin that must be injected in an attempt to prevent isoimmunization. Flow cytometry is an alternative to Kleihauer-Betke test [13]. For fetomaternal hemorrhage, a cut-off of 30 ml of fetal blood has been reported that contains red blood cells with antigen D that can be neutralized by the standard dose of 300 µg of anti-D immunoglobulin that is administered for the prophylaxis of alloimmunization. Although several factors associated with the presence of fetomaternal hemorrhage have

been identified, over 80% of the cases in which this cut off is exceeded do not have an identified cause [14]. Moderate or severe fetomaternal hemorrhage has a low incidence and occurs in 1-3 from 1000 live births [15]. Fetomaternal hemorrhage can occur as early as 4 weeks of gestation and was associated with various situations such as amniocentesis, maternal abdominal trauma, manual extraction or abruption of placenta [16].

The presence of alloimmunization can cause consequences such as hemolytic disease of the fetus [17] or hydrops fetalis [18].

Fetal anemia was associated with a hyperdynamic circulation. When fetal anemia is present, there is a decrease in blood viscosity accompanied by an increase in venous return, causing an increase in cardiac output with an increase in the velocity at the MCA level. In the case of alloimmunization, repeated MCA-PSV measurement is recommended. A value of MCA-PSV corresponding to a value greater than 1.5 MoM is an indication for cordocentesis followed by blood transfusion or emergency elective delivery [19].

Maternal alloimmunization is the main cause of fetal anemia. Intravascular intrauterine transfusion is the first-line management in the case of moderate or severe fetal anemia. There is no consensus about the time of birth. The ideal is that the birth to be as close to term as possible and to have a newborn that requires little care, without or with moderate anemia [20].

Our case represents a rare situation for modern obstetrics and highlights the importance of careful follow-up of patients with Rh incompatibility. In this case, it was necessary to perform emergency cesarean section to save the life of the fetus, which presented signs of hypoxia and anemia objectified by ultrasound and CTG scanning. Signs of myocardial injury and ascites were present. Considering that there are guidelines for the follow-up of pregnancies with Rh incompatibility, cases similar to this should not be encountered.

Conclusions

The ultrasound follow-up of patients with Rh incompatibility and alloimmunization is very important for the timely detection of possible changes in Doppler parameters. In a few cases, severe fetal anemia and non-reassuring fetal status occur, which indicates emergency cesarean section.

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