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Case Report

Rh incompatibility: A case study

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ABSTRACT

Rh incompatibility occurs during pregnancy. Rh antibodies cross the placenta and attack the baby's red blood cells leading to Hemolytic anemia. With Rh incompatibility, the woman's immune system reacts and creates Rh antibodies. Rh incompatibility happens only when the father of the baby is Rh-positive. Difference in blood type between a pregnant woman and her child causes Rh incompatibility. Nurse plays a vital role to offer psychological support to the mother and also to the members of the family.

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1. Introduction

The Rhesus factor, or Rh factor, is a certain type of protein found on the outside of blood cells. People are either Rh-positive (they have the protein) or Rh-negative (they do not have the protein).

This distinction mostly matters when women are Rh-negative and the child is Rh-positive. The protein is genetically inherited (passed down from parents). Majority of people, about 85%, are Rh-positive.

The incidence of maternal Rh immunization in Rh-negative women following a single ABO compatible Rh-positive pregnancy is about 17%. Maternal Rh immunization occurs almost exclusively after delivery; however, antibodies may not be detectable in the absence of further antigenic stimulation.¹

Antibody formation can happen after blood transfusions or when fetal blood enters the mother's circulation in case of Early pregnancy complications such as miscarriages, ectopic pregnancies, or terminations, Injury to the stomach area during pregnancy, Bleeding during

pregnancy, Tests that require cells or fluids to be withdrawn from a pregnant woman (like amniocentesis and chorion villus sampling), Delivery of a baby (either vaginal or cesarean).²

1.1. Signs and symptoms

Expectant mothers who are pregnant for the first time don't typically have issues with Rh sensitivity and incompatibility. After the first pregnancy, however, an Rh-negative mother becomes sensitized to an Rh-positive baby.

1. Yellow amniotic fluid (During pregnancy, the amniotic fluid surrounding the baby will appear yellow due to bilirubin, which occurs when blood cells break down.)
2. Jaundice (The skin and the whites of the baby's eyes will appear yellower than average.)
3. Heart failure.
4. Enlarged organs, otherwise known as hydrops fetalis (The baby's stomach, scalp, liver, heart, spleen and lungs may swell.)
5. Pale skin because of anemia.
6. Fast breathing.
7. Fast heart rate

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8. Swelling under the baby's skin.
9. Lethargy.
10. Kernicterus (Kernicterus remains a severe state of too much bilirubin in the baby's brain, which can cause brain damage, deafness, seizures, and death.)^{3,4}

1.2. Diagnosis

Healthcare provider can run the following test to ensure a proper diagnosis:

1. Test for Rh-positive antibodies in the mother.
2. An ultrasound to view the baby for fluid build-up.
3. Amniocentesis.
4. Percutaneous umbilical cord sampling of the fetal blood (During this test, a blood sample gets taken from the baby's umbilical cord. This sample gets tested for anemia, bilirubin, and other antibodies.)

1.3. Treatment for Rh-negative factor

Rh immune globulin injections can be given to keep your body from producing Rh antibodies. If you discover that you have Rh incompatibility problems, you'll need to receive these injections every time you have an Rh-positive baby. These injections remain both necessary and straightforward to keep you and your baby safe.

Another scenario that might expose you to Rh-positive blood during your pregnancy is miscarriages. If you get treated with Rh immune globulin immediately after a miscarriage, you won't have Rh incompatibility during your next pregnancy.

If you're looking to get pregnant, you should know whether you're Rh-negative or not. Also, be sure to tell your healthcare providers so that they can recommend the right treatment for you.

1.4. Treatment for Rh factor incompatibility

Various treatment options for Rh incompatibility exist. Talk to your doctor about which type of treatment is right for you. One treatment option is when a needle is placed through your uterus into your unborn baby's abdomen, and then into an umbilical cord vein. The baby may get sedated to prevent movement during this procedure.

Another treatment possibility is early delivery. If the pregnancy becomes quite complicated, the best solution remains for the baby to be born. Once the unborn baby's lungs have adequately matured, labor might get induced.

Thankfully, early testing and regular OB/GYN visits should keep both you and your baby healthy.⁴

1.5. Complications

Rh incompatibility does not affect pregnant women. In a baby, it can cause hemolytic anemia. Hemolytic anemia

causes a baby's red blood cells to be destroyed faster than they can be replaced.

The effects of hemolytic anemia can range from mild to severe. These effects may include jaundice, liver failure, and heart failure. Doctors treat this condition quickly depending on its severity.

1. For mild cases, no treatment may be necessary
2. For severe cases, a baby may receive a blood transfusion through the umbilical cord. This procedure helps replace the baby's red blood cells.
3. Babies who have jaundice, or a large amount of bilirubin in the blood, may be treated with special lights to help reduce bilirubin levels.⁵

1.6. Prognosis

While an Rh-negative woman will not be harmed by contact with Rh-positive blood, she will need RhIg injections after every contact with Rh-positive blood to reduce risks for babies in a future pregnancy. These events include:

1. Pregnancy, including miscarriage and abortion.
2. Blood transfusions.
3. Transplants involving blood or marrow cells.
4. Accidental needle-sticks with Rh-positive blood.⁶

2. Nursing management: A case study

A case of a lady with Rh-incompatibility is discussed with her consent. Mrs. Y, 28 years old female was admitted in antenatal ward of GMCH on 02.03.2021 with the complaints of pain in abdomen for 3 days, weakness and constipation for 4 days. It was accompanied with the complaints of inability to work and fatigue and anxiety for a week. She has had two miscarriages in the past both being spontaneous and at 10 weeks of pregnancy and 11 weeks of pregnancy respectively. She had been diagnosed for having Rh-incompatibility during her routine antenatal check-ups and counselling. She was admitted at term with 37 weeks of gestation for safe confinement. Her LMP was 08.07.2020 and EDD was 15.03.2021. During her pregnancy, she experienced the minor ailments of pregnancy and had no other associated problems. After taking the patient's hematologic and biochemistry parameters, the induction with 2IU of oxytocin was started for her. Her haemoglobin level stood at 11g/dl and blood group was A-ve. The symphysis fundal height at the time of examination corresponded to 36 weeks of gestation with foetal heart rate of 144 bpm. The patient then underwent normal vaginal delivery on 03.03.2021 and delivered a female child with the birth weight of 2.8kgs and blood group being B+ve. The mother was then administered Anti-D immunoglobulin on 03.03.2021 following the delivery of her child. The mother and the child both were in good state of health after the delivery. The mother was facing some difficulty

for breastfeeding the baby that was resolved later on with providing her support and involving the husband in care of their new-born.

2.1. Nursing care

The nursing care for the patient has been discussed elaborately by using the nursing process approach

2.2. Nursing diagnosis

1. Self-care deficient related to the impaired physical mobility and weakness secondary to the fatigue and generalised weakness.
2. Anxiety related to hospitalisation secondary to the adjustment in the new environment.
3. Activity intolerance related to pain and weakness secondary to the normal physiological changes of the pregnancy.
4. Knowledge deficit related to the present condition and care of new-born.
5. Fear related to the perinatal outcome and the health status of the new-born secondary to the lack of complete knowledge of the condition and its prognosis.

2.3. Expected outcome

The patient and the baby are expected to have a good health status and the normal family process is expected to be established with the involvement of both the partners in the care of the family.

2.4. Nursing interventions

1. The mother was given reassurance with need-based and factual information.
2. The husband and wife were made to get involved in the care of their new-born baby.
3. The doubts regarding the effect Rh-incompatibility can have on the consequent pregnancies was explained to the couple.
4. After the birth of the baby, the mother and the father were helped with the care of the baby at the initial stage and were then able to carry out the care.
5. The mother was advised on limiting her physical activities that were heavy. The husband was involved in the care with assisting with activities of self-care.
6. The mother was advised on performing low stress activities and resting in between working to maintain proper strength levels.

2.5. Evaluation

The couple was given the factual and need-based information about the Rh-incompatibility and they got the idea. The care of their new-born was taught to them and they exhibited adequate care for the baby with adequate knowledge on the prognosis of the condition and its potential effects on the child.

3. Conclusion

In order to reduce the occurrence of alloimmunization of the mother to erythrocyte antigens of the newborn that can lead to major complications in subsequent pregnancies of Rh D: negative mothers and HDN constant monitoring in order to prevent them is necessary. Prevention is essential because once immunized mother will remain immunized for life.

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5. Conflict of Interest

The author declares that there is no Conflict of interest.

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