



Rh INCOMPATIBILITY: A CASE STUDY

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ABSTRACT

Rh factor (Rhesus factor) is a type of protein which present on the outside surface of red blood cells. The protein on the surface of red blood cells determines an human blood type. Each blood type also has a positive or negative factor. A person gets Rh factor from their biological parents. If a person have the protein on their red cells that means he/she is Rh-positive. If a person don't have the protein on their red cells that means he/she is Rh-negative. According to research studies majority of people, about 85% are Rh-positive. Rhesus incompatibility has been an important cause for severe HDN and has been estimated to affect 3 to 8 for every 100 000 patients yearly, and before developing anti-D prophylaxis, it was responsible for fetal loss in 1% of all pregnancies, including hyperbilirubinemia (jaundice), hydrops fetalis, and still births. The incidence of Rh-negative pregnancies in Indian women was reported from 3.0% to 5.7%.

KEYWORDS : Rh Incompatibility, Mother, Baby, Blood

OVERVIEW OF Rh FACTOR AND Rh INCOMPATIBILITY

Rh factor (Rhesus factor) is a type of protein which present outside surface of red blood cells. The protein on the surface of red blood cells determines a human blood type. Each blood type also has a positive or negative factor. The positive or negative next to the blood type is human Rh factor. Rh factor doesn't cause problems or hurt human health in any way. A person gets Rh factor from their biological parents. If a person have the protein on their red cells that means he/she is Rh-positive. If a person don't have the protein on their red cells that means he/she is Rh-negative. According to research studies majority of people, about 85% are Rh-positive. It only becomes important when blood types are mixed together, like during pregnancy and childbirth. So During Pregnancy, complication may occur if mother is Rh negative and the fetus is Rh positive. So this condition is called Rh factor incompatibility¹

This means that if blood cells from the baby cross mother bloodstream, which can happen during pregnancy, labor, and delivery as discussed previously so mother immune system will make antibodies against baby's red blood cells. These antibodies are parts of human body's immune system. They destroy foreign substance. If mother have an Rh-negative blood type, than she is considered "sensitized" to positive blood types once mother body has made these antibodies. This means that mother body might send these antibodies across the placenta to attack baby's red blood cells and cause hemolysis. Placenta is the organ that connects mother and baby for exchange of nutrients and elimination of waste.²

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The incidence of Rh-negative pregnancies in Indian women was reported to be low, varying from 3.0 to 5.7%.⁴

SIGN AND SYMPTOMS

Antenatal mothers who are pregnant for the first time don't

typically have issues with Rh sensitivity and compatibility. After the first pregnancy however an Rh negative mother becomes sensitized to an Rh positive baby.

Rh incompatibility symptoms in unborn baby can range from mild to life-threatening. When maternal antibodies attacks baby's red blood cells, hemolytic disease can occur. When baby's healthy red blood cells are destroyed, bilirubin will build up in their bloodstream. Too much bilirubin is a sign that the liver, which is responsible for processing old blood cells, is having trouble. Baby may have one or more of the following symptoms

- Jaundice, a yellowing of the skin and whites of the eyes
- Lethargy
- Low muscle tone
- Heart failure
- Enlarged organs, otherwise known as hydrops fetalis (the baby's stomach, scalp, liver, heart, spleen and lungs may swell.)
- Fast breathing
- Fast heart rate
- Swelling under the baby's skin.⁵

DIAGNOSIS

Health care provider can ensure the following test to make proper diagnosis

- The Rh factor test is a simple blood test (called a type and screen) that every pregnant mother gets in the first trimester of pregnancy (usually at first prenatal visit). The Rh factor test determines maternal Rh factor.
- Percutaneous umbilical cord sampling of the fetal blood (this sample gets tested for anemia, bilirubin and other antibodies.
- An Ultrasound to view the baby for fluid buildup
- Amniocentesis

TREATMENT FOR Rh NEGATIVE FACTOR

Rh immune globulin injections can be given to the mother so that her body didn't produce Rh antibodies. If mother discover that she is having Rh incompatibility problems, she needs to receive Rh immune globulin injections every time she have an Rh-positive baby. Rh immune globulin injections remain both necessary and straightforward to keep mother and her baby

safe.

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

If a woman looking to get pregnant, she should know whether she is Rh-negative or not. Also, be sure to tell her healthcare providers so that they can recommend the right treatment for her.

TREATMENT FOR Rh INCOMPATIBILITY

Various treatment options for Rh incompatibility exist. Talk to the doctor about which type of treatment is right for the mother. One treatment option that is intrauterine blood transfusion, in this a needle is placed through mother uterus into her 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.

For mild Rh incompatibility is treated with using phototherapy bilirubin lights.

Thankfully, early testing and regular OB/GYN visits should keep both mother and her baby healthy.¹

COMPLICATIONS

Complications mainly seen in babies, 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 only phototherapy needed.
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.⁶

PROGNOSIS

While an Rh-negative woman will not be harmed by contact with Rh-positive blood, she will need Rhlg 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.⁷

NURSING MANAGEMENT- A CASE STUDY

A case of a lady with Rh-incompatibility is discussed with her consent. Mrs. X, 29 years old female was admitted in antenatal ward of Maharishi Markandeshwar Medical College and Hospital, Kumarhatti, Solan on 25.11.2023 with the complaints of amenorrhea since 9 months pain in abdomen for 2 days on and off, leaking per vagina since 2 days. It was accompanied with the complaints of inability to work, fatigue and anxiety for a week. She has had one miscarriage in the past and it was spontaneous at 9 weeks of gestation. She had been diagnosed for having Rh-incompatibility during her routine antenatal check-ups and

counselling. She was admitted at term with 39 weeks and 5 days of gestation for safe confinement. Her LMP was 20.02.2023 and EDD was 27.11.2023. During her antenatal period she confirmed her pregnancy with UPT kit after 7 days of missed periods she experienced 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 12.1g/dl and blood group was A^{ve}. The symphysis fundal height at the time of examination corresponded to 37 weeks of gestation with fetal heart rate of 140 bpm. The patient then underwent normal vaginal delivery with right mediolateral episiotomy on 25.11.2023 and delivered a female baby with the birth weight of 2.670gm and blood group being B^{ve}. The mother was then administered Anti-D immunoglobulin on 25.11.2023 following the delivery of her baby. The mother and the baby both were in good state of health after the delivery. The mother was facing some difficulty for breastfeeding the baby and pain in her episiotomy that was resolved later on with providing her support and care further involving the husband in her routine care along with new-born care.

NURSING CARE

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

NURSING DIAGNOSIS

1. Acute pain related to right mediolateral episiotomy incision as evidenced by her verbalization and pain rating scale.
2. Self-care deficient related to the impaired physical mobility and weakness as evidenced by fatigue and pain in episiotomy.
3. Imbalanced nutritional status less than body requirement related to pain and irritation as evidenced by intake and output chart.
4. Disturbed sleeping pattern related to physical discomfort and newborn feeding needs as evidenced by irritation and looking tired.
5. Anxiety related to hospitalization as evidenced by poor adjustment in the new environment.
6. Knowledge deficit related to the present condition and care of new-born.
7. Fear related to the perinatal outcome and the health status of the new-born as evidenced by asking few questions and found lack of complete knowledge of the condition and its prognosis.

EXPECTED OUTCOMES

The mother 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 mother and baby.

NURSING INTERVENTIONS

1. The mother was given reassurance with need-based and factual information.
2. The parents were made to get involved in the care of their new-born baby.
3. The doubts regarding the effect Rh-incompatibility on the consequent pregnancies was explained to the couple and answer given to their questions.
4. After the birth of the baby, parents were involved in the assistance to care of the baby at the initial stage and then they will be able to carry out the care of baby independently.
5. The mother was advised to limiting her physical activities that were heavy. The husband was involved in the care and assisting her for activities of self-care.
6. The mother was advised on performing low stress activities and resting in between working to maintain proper strength levels.
7. Mother is educated about perineal care and about breast

feeding benefits and techniques.

EVALUATION

Factual and need-based information has been given to the parents about the Rh-incompatibility after this they get the answer of their doubts and needed information. Taught about the care of new born so that they implement this knowledge adequately in the care of baby. Further knowledge has been given on the prognosis of the condition and its potential effects on the child.

CONCLUSION

In order to reduce the occurrence of alloimmunization in mother to the erythrocyte antigens of the newborn that can lead to major complications in subsequent pregnancies of Rh D negative mothers and HDN. So 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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