

The outlines

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DEFINITION OF RH:

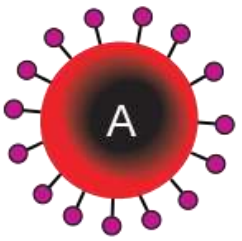
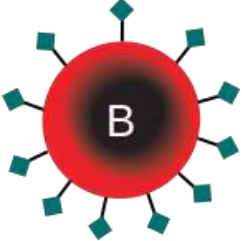
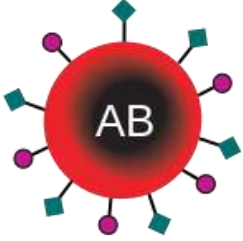
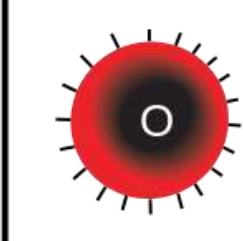
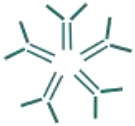

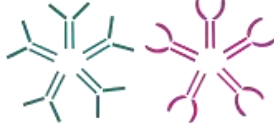



- Rh factor is a type of protein on the surface of red blood cells. Most people who have the Rh factor are Rh-positive. Those who do not have the Rh factor are Rh-negative.

The Rh Factor

- Also called **D antigen**
- Either Rh positive (Rh⁺) or Rh negative (Rh⁻)
- Only **sensitized Rh⁻** blood has anti-Rh antibodies

	Surface Antigens	Antibodies
Rh⁺	Rh factor	none
Rh⁻	none	none
Rh⁻ Sens	none	Anti Rh

➤ Basics blood types:

	Group A	Group B	Group AB	Group O
Red blood cell type	 A	 B	 AB	 O
Antibodies in Plasma	 Anti-B	 Anti-A	None	 Anti-A and Anti-B
Antigens in Red Blood Cell	 A antigen	 B antigen	 A and B antigens	None

Definition of Rh Incompatibility:

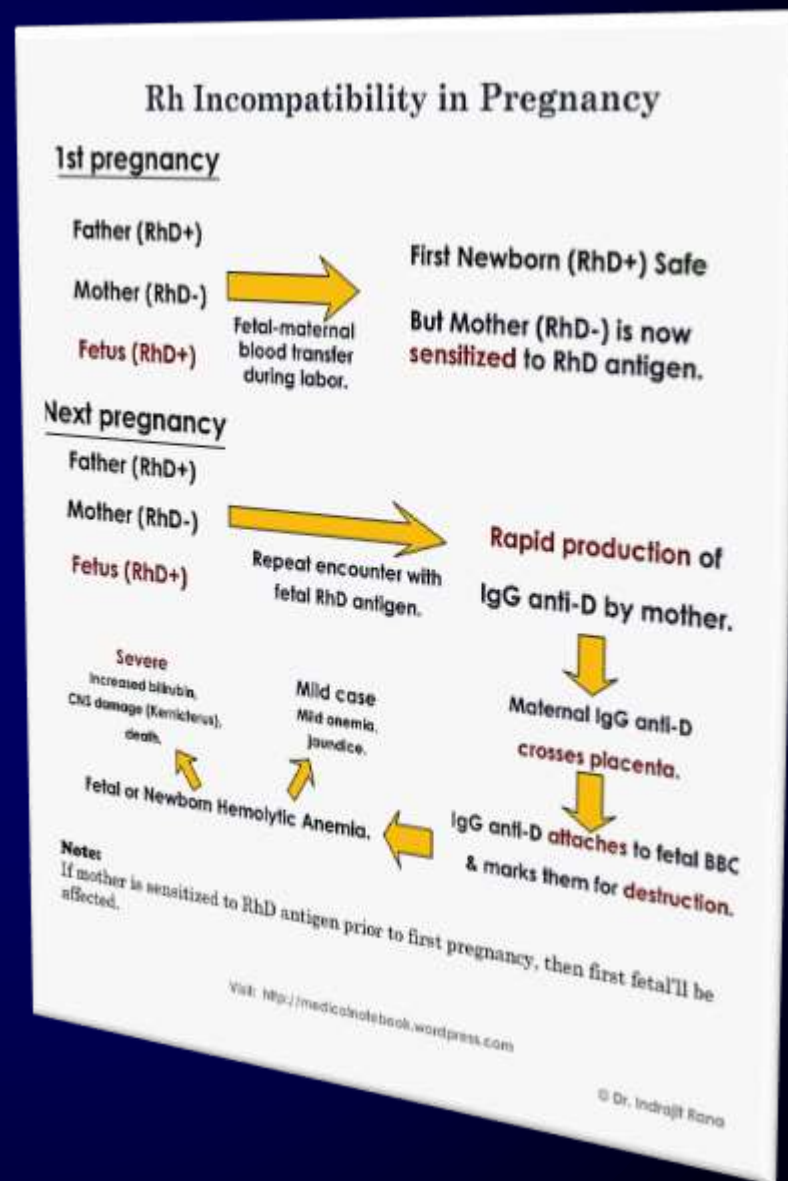
- ❖ The difference in Rh blood group types between an Rh negative mother and her Rh positive fetus that leads to hemolytic disease of the newborn. The mother and baby's Rh blood group types are therefore said to be "incompatible."

Pathophysiology of Rh Incompatibility:

- The amount of fetal blood necessary to produce Rh incompatibility varies. In one study, less than 1 mL of Rh-positive blood was shown to sensitize volunteers with Rh-negative blood.
- Once sensitized, it takes approximately one month for Rh antibodies in the maternal circulation to equilibrate in the fetal circulation. In 90% of cases, sensitization occurs during delivery.
- Therefore, most firstborn infants with Rh-positive blood type are not affected because the short period from first exposure of Rh-positive fetal erythrocytes to the birth of the infant is insufficient to produce a significant maternal IgG antibody response.
- The risk and severity of sensitization response increases with each subsequent pregnancy involving a fetus with Rh-positive blood. In women who are prone to Rh incompatibility, the second pregnancy with an Rh-positive fetus often produces a mildly anemic infant, whereas succeeding pregnancies produce more seriously affected infants who ultimately may die in utero from massive antibody-induced hemolytic anemia.

Risk of sensitization depends largely upon the following 3 factors:

- Volume of transplacental hemorrhage .
- Extent of the maternal immune response .
- Concurrent presence of ABO incompatibility .



CAUSES RH INCOMPATIBILITY :

- A difference in blood type between a pregnant woman and her baby causes Rh incompatibility. The condition occurs if a woman is Rh-negative and her baby is Rh-positive.
- When you're pregnant, blood from your baby can cross into your bloodstream, especially during delivery. If you're Rh-negative and your baby is Rh-positive, women body will react to the baby's blood as a foreign substance.
- Women body will create antibodies (proteins) against the baby's Rh-positive blood. These antibodies can cross the placenta and attack the baby's red blood cells. This can lead to hemolytic anemia in the baby.
- Rh incompatibility usually doesn't cause problems during a first pregnancy. The baby often is born before many of the antibodies develop.
- However, once women have formed Rh antibodies, they remain in your body. Thus, the condition is more likely to cause problems in second or later pregnancies (if the baby is Rh-positive).
- With each pregnancy, women body continues to make Rh antibodies. As a result, each Rh-positive baby you conceive becomes more at risk for serious problems, such as severe hemolytic anemia .

Symptoms of Rh Incompatibility:

- Your unborn baby's symptoms can range from mild to life-threatening. When women antibodies attack women baby's red blood cells, hemolytic disease can occur. This means women baby's red blood cells are destroyed.
- When women baby's healthy red blood cells are destroyed, bilirubin will build up in their bloodstream. Bilirubin is a chemical that's created from the breakdown of red blood cells. Too much bilirubin is a sign that the liver, which is responsible for processing old blood cells, is having trouble.
- **Your baby may have one or more of the following symptoms if their bilirubin levels are high after birth:-**
 - *yellowing of the skin and whites of the eyes, which is called jaundice .*
 - *Lethargy .*
 - *low muscle tone .*
 - *Hemolytic anemia .*
 - *These symptoms will subside once treatment for the Rh incompatibility is completed .*

High risk group of Rh Incompatibility:

- Any woman who is Rh-negative and is having a child with a father who is Rh-positive or with an unknown Rh status is at risk for Rh incompatibility.
- Factors that influence an Rh-negative pregnant female's chances of developing Rh incompatibility include the following:
 - Entopic pregnancy .
 - Placenta previa .
 - Placental abruption .
 - Abdominal/pelvic trauma .
 - In utero fetal death .
 - Any invasive obstetric procedure (eg, amniocentesis).
 - Lack of prenatal care .

Diagnosis of Rh Incompatibility:

- A blood test to determine women Rh status will likely be done at your first prenatal visit with your doctor. If women is Rh-negative, women partner may also be tested. If her partner is also Rh-negative women don't have anything to worry about. If your partner is Rh-positive and she is Rh-negative, her doctor will look for these signs of Rh incompatibility:-
- A positive direct Coombs test is a sign of Rh incompatibility. This test uses a blood sample to look for the presence of cell-destroying antibodies on the surface of your red blood cells.
- Higher-than-normal levels of bilirubin in your infant's blood is a sign of Rh incompatibility. In a full-term baby who is less than 24 hours old, the levels of bilirubin should be less than 6.0 milligrams per deciliter.
- Amino centesis to check for hyperbilirubinemia in amniotic fluid.
- Ultrasound to check for fetal organs megally "liver, spleen".
- Doppler ultrasound to check fetal blood flow if fast it indicates that there is sever anemia.

Prevention of Rh Incompatibility:

- Rh incompatibility is almost completely preventable. Rh-negative mothers should be followed closely by their providers during pregnancy.
- Special immune globulins, called RhoGAM, are now used to prevent RH incompatibility in mothers who are Rh-negative.
- If the father of the infant is Rh-positive or if his blood type is not known, the mother is given an injection of RhoGAM during the second trimester. If the baby is Rh-positive, the mother will get a second injection within 72hours after delivery.
- These injections prevent the development of antibodies against Rh-positive blood. However, women with Rh-negative blood type must get injections:
 - *During every pregnancy .*
 - *After a miscarriage or abortion .*
 - *After prenatal tests such as amniocentesis and chorionic villus biopsy*
 - *After injury to the abdomen during pregnancy .*

Complication of Rh Incompatibility:

Severe cases, in which the effects of Rh incompatibility aren't prevented, can result in severe complications. These complications may include:

- *Brain damage to the baby due to deposition of bilirubin in CNS tissue "kernicterus".*
- *Fluid buildup or swelling in the baby "by drops fetalis".*
- *Trouble with mental function, movement, hearing, and speech.*
- *seizures .*
- *anemia .*
- *heart failure .*
- *Death of the baby can also occur. Rh incompatibility is rarely a problem in countries with good medical care.*

Treatment of Rh Incompatibility:

Treatment focuses on preventing the effects of the incompatibility. In mild cases, the baby can be treated after birth with:

- *a series of blood transfusions*
- *hydrating fluids*
- *electrolytes, which are elements that regulate metabolism*
- *Phototherapy involves keeping your baby near fluorescent lights to help reduce the bilirubin in their blood.*
- *If you're pregnant and your doctor determines that you've already developed antibodies against your baby, your pregnancy will be closely monitored.*