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Your Blood Type

Adapted from Pomegranate Midwives

Rh Sensitization

The blood type of 85% of the world population is Rh positive. If you are part of the remaining 15% who are Rh negative, please read this handout.

How might my Rh factor affect my pregnancy?

Rh refers to your blood type. You are either Rh-positive or Rh-negative. For example, your blood type might be A-negative.

The Rh factor can cause problems if an Rh-negative pregnant person and their Rh-positive partner conceive a baby that is Rh-positive. It is not possible to know if the baby is Rh-positive until birth.

There are two steps involved in "sensitization" (also known as isoimmunization) when the pregnant person's blood sees their baby's blood as foreign:

1. Transplacental hemorrhage: During pregnancy, although the pregnant person and the baby have separate blood systems, blood from the baby can sometimes cross the placenta into the pregnant person's system.

2. Antibody formation: Once the baby's blood has mixed into the pregnant person's system, they can become sensitized. This means that the pregnant person produces antibodies to fight the baby's blood as if it were a harmful foreign substance. (Antibodies, for example, help us fight infections and viruses and are our body's way of getting rid of whatever seems harmful to us). If these antibodies then cross the placenta to the baby, they will attack the fetal blood cells.

Once formed, antibodies are permanent. During the pregnancy when sensitization occurs, the baby is usually born before the pregnant person develops enough antibodies to harm the baby. The concentration of antibodies becomes higher in later pregnancies, therefore the danger is greater for babies born after you have become sensitized.

What factors can cause Rh sensitization?

Sensitization can also occur after any physical violence, accident (such as a car accident) or procedure that might involve or cause bleeding from the placenta. These include amniocentesis, chorionic villus sampling, abdominal injury, abruption of the placenta, miscarriage, placenta previa or external version of a breech baby.

Sensitization can occur even if a pregnancy ended in miscarriage, abortion, cesarean, or was an ectopic pregnancy.

How do I know if I have become Rh sensitized?

Your blood can be tested anytime to determine if you have any antibodies. This is usually done in the initial bloodwork, again at approximately 28 weeks, and then again shortly after the birth.

What happens if I become Rh sensitized?

Rh sensitization can result in hemolytic disease of the newborn. The seriousness of this condition can vary. Some babies have no symptoms. In more severe cases, problems such as hydrops can cause the baby to die before, or shortly after birth. Severe hemolytic disease of the newborn may be treated before birth by intrauterine blood transfusion.

In some babies it becomes apparent during pregnancy, other times, the first sign is jaundice in the first 24 hours, which usually requires a transfusion and intensive care.

An Rh sensitized pregnant person can be checked during their pregnancy to see if the baby is developing blood disease, through the use of amniocentesis and ultrasound.

There are no immediate consequences to the pregnant person if Rh sensitization occurs.

How can I try to prevent sensitization?

The most commonly accepted treatment is injection with Rh(D) immunoglobulin. In Canada, Rh(D) IG is packaged and sold as WinRho.

Although 90% of sensitizations occur during birth, 1-2% occur before the baby is born. Because of this, Rh(D) IG is offered at 28 weeks of pregnancy. It is protective till the birth, when there is the greatest risk of sensitization.

After the birth, the baby's blood is tested for blood type. If baby is Rh+, you will be offered another dose of Rh(D) IG within 72 hours.

Rh(D) IG should also be administered within 72 hours of any other incident or indication (such as amniocentesis, abdominal trauma or bleeding from your uterus).

How effective is the treatment?

Rh(D) IG reduces but does not eliminate the possibility of Rh sensitization. The risk of sensitization after birth of an Rh+ baby is:

- 7-17% without treatment
- 1-2% with postpartum treatment only
- 0.1– 0.2% with antenatal (at 28 weeks) and postpartum treatment

What are the risks of treatment?

Rh(D) IG is developed by injecting human volunteer donors (Rh-negative) with the positive Rh factor, then drawing their blood once antibodies have been formed. This blood is treated and screened for viruses (such as HIV and Hepatitis) and concentrated into a serum for injection. Rh(D) IG is a human-blood product and therefore is at risk of containing unknown viruses.

Injection of Rh(D) IG carries the risk of anaphylaxis, an extreme and very rare allergic reaction.

Some brands of Rh(D) IG, such as RhoGam which is used in the United States, contain the preservative thimerosol, which is a mercury derivative. Mercury crosses the placental barrier. The Canadian version, with the brand-name WinRho, does not contain a mercury preservative.

Are there any alternative treatments?

There are no known alternative treatments to Rh(D) IG injections.

Thalassemia & Pregnancy

What is thalassemia?

Thalassemia is the name of a group of inherited blood disorders. There are two main types of thalassemia: alpha and beta, in reference to the alpha and beta proteins that form hemoglobin in the blood. Hemoglobin is the oxygen-carrying component of red blood cells, so if the body doesn't produce enough of either of these two proteins, the result is anemia that begins in early childhood and lasts throughout life.

What are the effects of thalassemia?

Thalassemia ranges widely in severity. Babies born with thalassemia may have mild to severe anemia, may develop jaundice, organ damage or even die.

How is thalassemia transmitted?

Thalassemia is an inherited disease, i.e. it is passed on by parents who have the thalassemia gene.

Because the gene is recessive, both parents must each pass on the thalassemia gene in order for the baby to have the full disease.

If the baby only inherits one gene, s/he will become a carrier but not express the full disease. Sometimes this carrier state is referred to as "thalassemia trait". Most carriers lead normal, healthy lives. They may not even realize that they carry this gene.

When both parents are carriers:

- 1 in 4 chance that their child will inherit 2 thalassemia genes and have severe outcomes of the disease = Thalassemia major

- 2 in 4 chance that the child will inherit the thalassemia trait, i.e. become a carrier = Thalassemia minor

- 1 in 4 chance that the child will inherit 2 normal genes

How is thalassemia diagnosed?

When you do your routine blood test at the beginning of your pregnancy, one result we review is the Mean Corpuscular Volume, or MCV. The MCV reading determines the size of your red blood cells. For adults, if the MCV reading is less than 75 you may be a trait carrier. If your MCV reading indicates that you may have the thalassemia trait, additional blood tests can be performed to make sure.

Genetic counseling can also aid in identifying if you should have this blood test. Because thalassemia occurs most commonly among Mediterranean, Middle-Eastern, Asian, and African people, if you and your partner are from any of these groups, you may want to consider genetic counseling and/or further testing.

During pregnancy, chorionic villus sampling (CVS) or amniocentesis can detect or rule out thalassemia in the fetus. Early diagnosis is important so that treatment can prevent complications.

What is the treatment for thalassemia?

The use of frequent blood transfusions and antibiotics has greatly improved the outlook for children born with thalassemia. Still, there is a chance that these babies will be born with major organ damage and may not live a full life span.