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MIDWIVES

Information on Blood Groups, RH Factor and RH Immune Globulin

What are blood types or groups?

There are 4 blood group types: A, B, AB and O. These groups represent the presence or absence of two different proteins called antigens on the surface of the person's red blood cells. An individual either has only A antigens (Group A), only B antigens (Group B), a combination of A and B antigens (Group AB) or neither A nor B antigens (Group O) on their red blood cells. There is another protein (antigen) that is either present (positive) or absent (negative) on the red blood cells. This is Rh factor. These characteristics are inherited from our biological parents, one characteristic from each parent. A person with Group A blood that is Rh+ has A antigens and the Rh factor on the red blood cells.

Why is blood typing important during pregnancy?

If the biological parents have different blood groups, then the baby could have a different blood group than the mother. This could lead to a minor blood group incompatibility. This is rarely a significant problem. However, if the mother is Rh- and the baby is Rh+, there can be a serious immune response by the mother if the baby's blood enters her circulation. The mother's immune system makes antibodies to the Rh+ antigens on the baby's red blood cells, this destroys the red blood cells that contain Rh+ antigens, just as if they were a bacteria or a virus. The mother's immune system retains a memory of this process so that if more Rh+ blood enters her system antibodies can be produced quickly, in great numbers to destroy the invading cells. Such a mother is said to be "Rh sensitized". This is a permanent condition. Blood can be tested for sensitization: this is an antibody screen test or indirect Coomb's test, done routinely at the first prenatal visit.

This immune response can happen during the pregnancy of the Rh- woman with an Rh+ baby if a small or large amount of the baby's blood enters the mother's circulation. The mother will make antibodies to destroy the Rh+ blood cells in her system. These antibodies can cross the placenta and enter the baby's circulatory system. Once there, the antigens begin to destroy the baby's red blood cells. This can cause the baby to become anemic if only a small amount of maternal antigens cross the placenta. If too many red blood cells are destroyed, the baby will become seriously ill and may die. This is called "hemolytic anemia".

What is Rh Immune Globulin?

Rh Immune Globulin is a substance made by pharmaceutical companies to neutralize the effect of this immune response in pregnant women who have Rh- blood. It is made by injecting Rh- men with Rh+ blood then extracting the antibodies produced from the donated blood. The extract is purified by vigorous processing and has not been associated with the transmission of blood-borne diseases. Rh immune globulin (called Rhogam or Win Rho) works by binding the Rh+ antigens on the "invading" fetal blood. This

prevents the mother's immune system from being stimulated by the Rh+ antigens and forming her own antibodies. Because of this her immune system has no memory of "invasion" by Rh+ cells and she is NOT sensitized.

What if the baby's father is Rh-?

When an Rh-woman is pregnant, unless the biological father of the baby is known to be Rh- also, it is assumed that the baby might be Rh+. The baby's blood type will be tested after birth. if the biological father is Rh-, then the baby will also be Rh-, the immune response will not occur and nothing further will need to be done to the mother or baby.

Who is offered Rh Immune Globulin?

Rh Immune Globulin is routinely offered to all Rh- pregnant women who have tested negative for Rh antibodies on the prenatal blood screening.

- After potential leakage of fetal blood into the mother's system such as: placental or abdominal trauma, after a fall or accident, placenta previa, placental abruption, any uterine bleeding, external version of a breech presentation, a miscarriage or abortion, amniocentesis or chorionic villi sampling.

- When the mother reaches 28 weeks of gestation, if the repeat Rh antibodies test is negative. The effect lasts 3 months.

- Within 3 days of birth if the baby is Rh+. A sample of the baby's blood is collected from the baby's umbilical cord and sent to the lab for blood type testing.

Are there any risks associated with the administration of Rh Immune Globulin?

- There may be pain and soreness at the sight of the injection.

- There is a possibility of an allergic reaction to the medication. This is extremely rare.

- As described earlier, Rh Immune Globulin is a blood product. However, there are no documented cases of blood borne illnesses such as HIV or Hepatitis being transmitted via Rh Immune Globulin. Rh Immune Globulin undergoes extensive preparation, purification and preservation and is considered completely safe.

- If the amount of fetal blood in the mother's system is large, more than one dose of Rh Immune Globulin may be necessary.

Rh Immune Globulin (Rhogam) has made erythroblastosis fetalis, "hemolytic anemia", caused by sensitization to the Rh+ antigen a preventable disease and fetal newborn deaths from sensitization have fallen 100- fold. While there have been other factors that have contributed to this reduction such as reduced family size and the quality of prenatal care, Rhogam has played a primary role.

Maternal sensitization still occurs in approximately 1% - 2% of Rh- women in Canada usually from failure to administer Rhogam to pregnant or postpartum women or because of inadequate dosing schedules.

If an Rh- mother does not receive postpartum Rhogam after an Rh+ baby, the incidence of sensitization during the next pregnancy is 12% - 16% compared to 1.6% - 1.9% in mothers receiving postpartum Rhogam.

Without administering antenatal Rhogam at 28 - 29 weeks, 1.6% - 1.9% of Rh- women are at risk of becoming sensitized. Routine antenatal Rhogam reduces the rate of sensitization during pregnancy to 0.2%.

The above information is based on evidence collected from The Cochrane Library and Medline and listed in the SOGC Clinical Practice Guidelines.

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Refusal For Rh Immune Globulin

I have read the information provided and have had the opportunity to ask questions. I understand the risks and benefits of receiving or declining Rh Immune Globulin.

____ I **decline** to have Rh Immune Globulin during my pregnancy but wish to have my baby's blood tested at birth. If my baby is Rh+, I will accept antibody screening and Rh Immune Globulin at that time.

____ I **decline** Rh Immune Globulin during my pregnancy and postpartum. If I change my mind or wish to further discuss, I will advise you.

____ I **agree** to the Rh Immune Globulin during my pregnancy and postpartum. If I change my mind or wish to further discuss, I will advise you.

____ I **decline** the collection of cord blood postpartum, in order to identify my baby's Rh, and postpartum antibody screening.

____My baby's father is Rh-. I am providing verification of his blood type.

Client's Signature **Date**

Midwife's Signature **Date**