Finnish Red Cross
Blood Service

ANTENATAL BLOOD GROUP TESTS AND BLOOD GROUP ANTIBODY SCREENING

- INFORMATION FOR PREGNANT MOTHERS

WHAT ARE BLOOD GROUPS?

Blood groups are based on the components of red blood cells' surface structure, which a baby inherits from both parents. The most significant blood groups concerning pregnancy and blood transfusions are the ABO and RhD blood groups. Information on a pregnant mother's blood group (A, B, O or AB and RhD positive or RhD negative) is recorded on her maternity card and in the maternity hospital's patient information system.

WHAT DOES BLOOD GROUP IMMUNIZATION MEAN?

If the mother and the fetus have different blood groups, the mother's immune system may start making antibodies against fetal red cells. This is called immunization.

The most common cause of immunization is delivery but small numbers of fetal red blood cells can cross the placenta and enter the mother's bloodstream already during pregnancy. Sometimes immunization is caused by a blood transfusion the mother has received previously. The mother's antibodies can cross the placenta and attack the baby's red blood cells, destroying them and leading to the haemolytic disease of the fetus and newborn. Blood group immunization does not usually cause problems to the fetus in the first pregnancy.

The Finnish Red Cross Blood Service screens samples from 60,000 pregnant mothers annually, with one per cent of mothers testing positive for an antibody that can affect pregnancy.

WHAT IS THE HAEMOLYTIC DISEASE OF THE FETUS AND NEWBORN?

The symptoms of the disease include anaemia, high blood bilirubin levels (hyperbilirubinemia) and yellowing of the skin. When mild, the disease is asymptomatic but if left untreated the most severe forms of the disease can lead to disability in the fetus or the newborn or even death.

Out of the various antibodies that can cause the haemolytic disease of the fetus and newborn, the anti-D antibody of the Rh blood group system is the most important. Around 13 % of Finnish mothers are RhD negative. RhD negative mothers can become immunized if the baby inherits an RhD positive blood group from the father. However, also RhD positive mothers can become immunized, the most significant antibody being anti-c of the Rh blood group system.

Other significant antibodies are anti-E of the Rh blood group system and anti-K of the Kell blood group system, which can be formed by both RhD positive and RhD negative mothers. ABO incompatibility (a mismatch in the ABO blood group) can cause mild yellowness in the newborn baby but antenatal tests are not necessary.

In Finland, around 150 children need treatment for the haemolytic disease of the fetus and newborn annually.

WHY ARE BLOOD GROUPS AND BLOOD GROUP ANTIBODIES TESTED?

All pregnant mothers are tested for the ABO and RhD blood groups and blood group antibodies. The goal is to identify mothers whose babies are at risk of the haemolytic disease of the fetus and newborn. All mothers will be re-tested in subsequent pregnancies as each pregnancy increases the likelihood of antibody production. The immunization of RhD negative mothers can be prevented by giving them anti-D immunoglobulin during pregnancy and after delivery.

Screening for blood group antibodies

- A blood sample is taken from all pregnant mothers between 8 and 12 weeks of pregnancy.
- Blood samples are taken from RhD negative mothers at 24–26 and 36 weeks of pregnancy as they have a higher risk of producing blood group antibodies. In addition, fetal RhD blood group is determined by using the mother's blood sample at 24–26 weeks of pregnancy to assess the need for anti-D immunoglobulin.
- If an RhD positive mother has received a blood transfusion or has had a previous baby needing treatment for yellowness as a newborn, an extra sample is taken at 36 weeks of pregnancy.

If the mother tests positive for antibodies, the antibody in question is identified and its level in the mother's blood measured. The antibody levels are then closely monitored during pregnancy and the information sent to the mother's maternity clinic and the university hospital, which plans the monitoring and care for the pregnancy. Because of modern treatment methods, the prognosis for the haemolytic disease of the fetus and newborn is usually good. In addition, the information on antibodies enables preparations to be made for blood transfusions the mother may need at delivery.

The Finnish Red Cross Blood Service carries out antenatal blood group and blood group antibody testing according to the recommendations of the National Institute for Health and Welfare maternity care expert group.

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