Hemolytic disease of the fetus and newborn

Patient Information Series – What you should know, what you should ask.

What is fetal anemia?

In some pregnancies, the unborn child may develop a lack of red blood cells, called anemia. The best-known causes of anemia are hemolytic disease of the fetus and newborn (HDFN, also called Rhesus disease) and fifth disease (Parvovirus B19 infection). Anemia of the unborn child is a serious, sometimes even life-threatening disease. Due to severe anemia, the oxygen transport of the child can be compromised. This can result in heart failure, fluid retention (called hydrops) and fetal death. Fortunately, if the anemia is detected in time, it can be treated well with blood transfusions while the child is still in the womb. This is called intrauterine (blood) transfusion (IUT).

What is HDFN?

Hemolytic disease of the fetus and newborn (HDFN) is one of the main and most common causes of fetal anemia. In this disease, there is a mismatch between the blood type of the pregnant person and the blood type of the child. During pregnancy or childbirth, a little blood from the fetus can enter the pregnant person's blood through the placenta. The chance of this increases during the course of pregnancy and is greatest around childbirth. In some cases, the pregnant person starts making antibodies against the blood of the fetus. These antibodies can cross the placenta and break down the blood of the fetus.

Anemia that develops in the fetus and after birth can cause hyperbilirubinemia (jaundice). Often the antibodies that lead to fetal anemia only come to light in a subsequent pregnancy. Fortunately, Rhesus disease is now much less common than it used to be because there are prevention programs since 1969. Within this prevention program, anti-D injection is given to pregnant people who have blood type Rhesus D negative and where the fetus is known to be Rhesus D positive. Anti-D aims to prevent pregnant people from forming antibodies against Rhesus D. However, there are also other rarer antibodies against which there is no prevention. Examples are antibodies against blood types Kell and c. In order to be able to detect HDFN in time and identify fetuses at risk, blood tests are done on every pregnant person at the beginning of pregnancy. The blood type, the Rhesus factor, and the presence of irregular antibodies are determined. The blood type of the baby is 50% determined by the characteristics of the other biologic parent. That is why before the blood type of the fetus is determined in the pregnant person's blood; the blood of the other biologic parent is first examined. If it turns out that the fetus has the blood type that is sensitive to the irregular antibodies, the amount of antibodies is measured in the pregnant person's blood.

Ultrasound examination

Any unborn child at risk of anemia is carefully examined by ultrasound. At each clinic visit, it is reassessed whether additional examination, treatment or delivery is necessary. At your first visit, the information provided or sent by the referring obstetrician will be discussed with you.

What is looked for on ultrasound?

The sonographer assesses your child's mobility, the amount of amniotic fluid, and performs a number of measurements that try to predict whether your child has significant anemia. These measurements include measuring the size of the heart. The heart of a fetus with anemia may be enlarged because it has an increased workload. After birth, the heart regains its normal size. During the ultrasound examination, the speed of blood flow in important blood vessels in your child are also measured, by a Doppler ultrasound technique. With anemia, the blood becomes less viscous and therefore flows faster. The blood flow rate is measured in an artery in the baby's head. If the child retains a lot of fluid in the presences of red cell antibodies, there is almost certainly severe anemia. Fluid retention (hydrops) is a sign of serious illness. With the frequent check-ups anemia can be diagnosed and corrected by giving a transfusion, before the child starts to retain fluid.

Treatment

There are two treatment options available for treating anemia. 1. A cord puncture with subsequent blood transfusion while the baby is still in the womb. 2. A premature birth, after which the baby is admitted and given a blood transfusion in the incubator department. The options discussed with parents will depend on the cause and severity of anemia, availability and advisability of in utero therapy and the gestational age of the fetus.

Neonatal care

If the baby has had blood transfusions before birth, it is advised that the delivery take place in the same center, or at least in a center with sufficient experience in this unusual type of care. After delivery, your baby will be admitted to the Neonatology department for observation. The main problems that can occur in the first days are anemia and an accumulation of 'bilirubin', which are degradation products of red cells. Treatment may include blood transfusions and light therapy (under the blue lamp). If the situation is stable, your child will be transferred to a hospital near your place of residence as soon as possible. In the first 6 to 12 weeks after birth, anemia may recur and one or more transfusions may be required.

More information about the treatment of anemia in the unborn child can be found in this video:

https://www.youtube.com/watch?v=kRFq023MMgk