

# Blood Groups and Red Cell Antibodies in Pregnancy



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At the beginning of your pregnancy and again in the last three months you will be offered a test to find out your blood group and to discover if you have any antibodies to red blood cells. This leaflet aims to give information about the significance of blood groups and 'red cell antibodies' in pregnancy. It also contains information about the treatment which prevents the formation of the 'red cell antibodies' which can cause *rhesus* disease of babies.

## What are blood groups?

Every red cell in your body carries on its surface the natural chemicals which make up your blood groups. You inherit your blood groups from both your parents. We all have many blood groups but fortunately very few are important. The most significant blood groups for us to know in your pregnancy are your ABO group and your D group.

Blood group	Possible blood types within the group
ABO group	O, A, B or AB
D group (Also called <i>rhesus</i> group)	D positive ( <i>rhesus</i> positive, the most common) or D negative ( <i>rhesus</i> negative)

In addition to ABO and D groups everyone has other, minor blood groups. Two of the minor blood groups that can be important in pregnancy are 'c' [little c] and 'K' [Kell].

## What are red cell antibodies?

Antibodies are part of the body's immune system. They are formed when the immune system comes into contact with a 'foreign' substance e.g. a virus, vaccine or a different blood group. The antibody that the immune system forms is specific to the type of foreign substance present.

So if 'foreign' red blood cells are in your blood stream you may form red cell antibodies against those 'foreign' cells. There are two main ways that 'foreign' red cells can enter your blood stream: as a result of a blood transfusion or during pregnancy.

## How are red cell antibodies formed during pregnancy?

During pregnancy it is common for a few of the baby's red cells to 'leak' into the mother's blood stream. The most usual time for this to happen is when the baby is born. If this happens, and the baby's blood is of a different group from the mother, there is a potential for antibodies to be formed by the mother's immune system. This is rare. Only about three in 100 pregnant women develop red cell antibodies and most of these are harmless. Our illustration overleaf shows how this happens.





## Why are blood groups and red cell antibodies important in pregnancy?

Your blood group has no effect on your day to day life and the presence of red cell antibodies is generally harmless. However, during pregnancy it is important to know your blood group and to know if you have formed any antibodies against red cells.

There are three main reasons for this and more details are given here:

### 1. In case you require a blood transfusion.

In the unlikely event of you needing a blood transfusion the blood which is selected for you must be of a suitable ABO and D group and also be a suitable match for any red cell antibodies you may have.

### 2. Knowing that you have formed antibodies against red blood cells, which could potentially affect your baby, will ensure that you receive any necessary treatment.

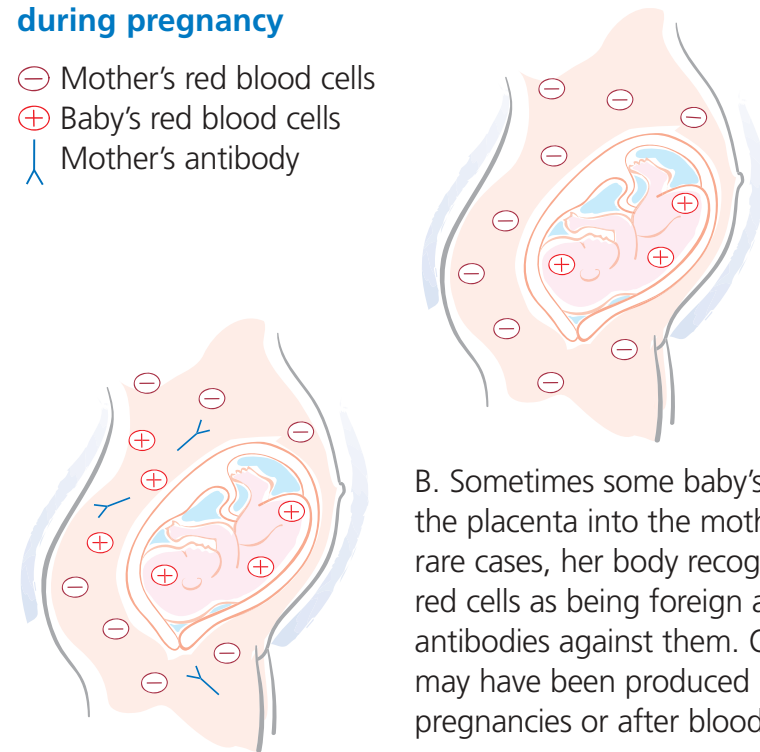
#### How could red cell antibodies affect my baby?

If you have formed red cell antibodies they can cross from your blood stream in to your baby's blood. The antibodies could damage your baby's red cells if they have the corresponding blood group. Our diagram shows how this can happen.

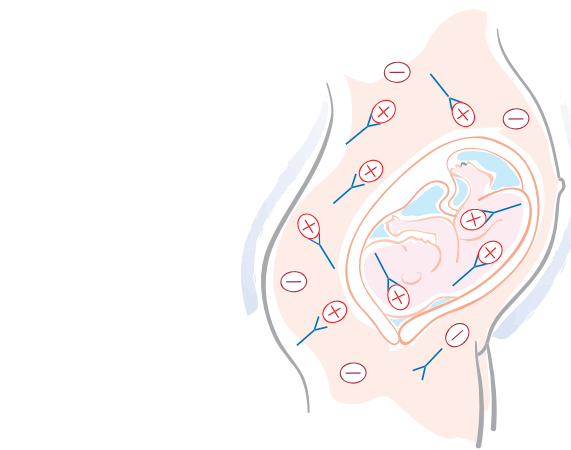
In most cases the baby does not come to any harm. However, with some antibodies, especially if the levels are high, the baby can become anaemic and develop yellow jaundice after birth. This condition is known as 'haemolytic disease of the new-born', also known as *rhesus* disease.

#### How red cell antibodies are formed during pregnancy

- ⊖ Mother's red blood cells
- ⊕ Baby's red blood cells
- Y Mother's antibody



A. This baby has a different blood group from the mother



B. Sometimes some baby's blood crosses the placenta into the mother's blood. In rare cases, her body recognises the baby's red cells as being foreign and makes antibodies against them. Or antibodies may have been produced in previous pregnancies or after blood transfusions.

C. These antibodies cross the placenta into the baby's blood. The antibodies can damage the baby's red blood cells if they have the corresponding blood group.





### **What will happen if I have antibodies to my baby's red blood cells?**

Pregnant women with some red cell antibodies are offered regular blood tests during pregnancy to monitor the level of the antibody.

A blood sample may be taken from the baby's father to help us to predict the possible blood group of the baby. This helps us predict whether or not the baby's red blood cells might be damaged by the mother's antibodies.

The baby is monitored closely during the pregnancy and after birth, as a precaution, and generally no treatment is required. However, if the antibody level rises very high, it may be necessary to deliver the baby early or, in very rare cases, to transfuse the baby in the womb. This sort of transfusion is called 'intrauterine transfusion' and is performed in specialist hospitals.

### **Which red cell antibodies are most likely to cause problems?**

The anti-D antibody is the most likely to cause problems. It can form if a mother whose blood group is D negative has a D positive baby. Fortunately there is a way of preventing the formation of anti-D. The red cell antibodies which are the next most likely to cause problems are anti-c and anti-K. Most other antibodies cause little if any harm.

## **3. Finding out if you are D negative. If you are D negative you may need to have extra treatment during pregnancy and/or after delivery.**

### **I am D negative, how does that affect me?**

It is important that you are identified as a mother with D negative blood early in pregnancy, so you can be advised if you need treatment during pregnancy to prevent the formation of the anti-D antibody.

### **How is the formation of anti-D antibody prevented?**

Formation of the anti-D antibody can be prevented by giving the mother an injection of 'pre-formed anti-D' ('prophylactic anti-D', or 'anti-D immunoglobulin'). This injection mops up the baby's red cells before the mother's immune system detects them, so stopping the mother forming the potentially harmful anti-D antibody.

This treatment, which has been in use for more than 30 years, is made from the plasma of specially selected blood donors.

### **When will I need treatment?**

If you are D negative you may need this injection following any of these events (your doctor or midwife will advise you):

- Hospital treatment for miscarriage or threatened miscarriage
- Termination of pregnancy
- Abdominal injury
- Vaginal bleeding
- Some diagnostic tests such as amniocentesis
- Turning of your baby.

The injection should be given ideally within three days of an event which might have caused a 'leakage', but it can work up to 10 days later. The injection does not affect the baby.

**It is also important to have an injection within 3 days after delivery, if your baby is D positive.**

It is recommended that you should also be offered anti-D during the last three months of your pregnancy. This is called 'routine antenatal prophylaxis' and is usually given as an injection at 28 and 34 weeks of pregnancy, although it may be local practice to give one injection at 28 weeks. Ask your midwife if you require more information.





## Further Information

If you have questions arising from this leaflet or there are things that concern you, please ask your doctor or midwife.

You may also find these websites useful:

Antenatal screening in general:

[www.nelh.nhs.uk/screening/antenatal\\_pps/antenatal.html](http://www.nelh.nhs.uk/screening/antenatal_pps/antenatal.html)

Routine antenatal anti-D prophylaxis:

[www.nice.org.uk/pdf/Anti\\_d\\_patient\\_leaflet.pdf](http://www.nice.org.uk/pdf/Anti_d_patient_leaflet.pdf)

Additional copies of this leaflet may be obtained from the National Blood Service. Call 0845 7 711 711.

## Data Protection

The National Blood Service (part of the NHS) keeps records of all the tests it performs, and of the advice it offers, in order to run its service effectively and safely. Your data will be held securely, and in accordance with your rights, under the Data Protection Act (1998).

Because of the rarity of haemolytic disease of the newborn, we ask hospitals for a few details about any baby that is affected by it, soon after the baby is born. We need this information to help us improve our knowledge, and so give the best possible care to all mothers and babies.