Anti-D prophylaxis in pregnancy
Elizabeth Garrett Anderson’s Wing Women’s Health
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Contents
Introduction 3
What are blood groups? 3
Why does being Rh D negative matter? 4
What are red cell antibodies? 4
How is the formation of anti-D antibody prevented? 7
When will I be given Anti-D? 7
Are there any risks of having Anti-D? 8
Is the Anti-D injection always effective? 9
What will happen if I choose not to have Anti-D injections? 9
Are there any alternatives are available? 10
Why might I not need the injection? 10
Where can I get more information? 10
Contact details 11
Introduction
When you first book for antenatal care at UCLH you will have a blood sample taken to find out your blood group and to check whether you have any red cell antibodies.

This leaflet is for pregnant women whose blood group is found to be Rh D (Rhesus) negative. This booklet explains what being Rh D negative means and the additional antenatal care you will be offered because you are Rh D negative.

In the past Rh D negative blood group used to be called Rhesus negative, but as it is now known as Rh D negative this term will be used throughout this booklet.

We offer all Rh D negative women an anti D injection routinely at 28 weeks, after the delivery of an Rh D positive baby and if they have any events in pregnancy that may indicate an additional anti D injection is required. The aim of these injections is to prevent the formation of an immune anti D antibody.

What are blood groups?
Red blood cells carry oxygen around your body. Every red blood cell in your body has natural substances on the surface of the cell known as antigens; these antigens make up your blood groups. You inherit your blood group types (antigens) from both parents.

The most significant blood groups for us to know about during your pregnancy are your ABO group and your Rh D group. There are also many other minor blood groups but we do not routinely test for these.

Everyone has an A, B, O blood group; you can be group A, B, O or AB. It is important for us to know your ABO blood group during pregnancy in case you need a blood transfusion.
Your blood group will also be either Rh D positive or Rh D negative.

**For example:** If your ABO group is O and your Rh D group is negative, you are O Rh D negative. You are Rh D negative; you do not have the D antigen (protein) on your red cells.

**Why does being Rh D negative matter?**

Rh D status matters if a woman who is Rh D negative becomes pregnant with a baby who is Rh D positive. Each year in England and Wales there are about 62,000 births of Rh D-positive babies to Rh D negative women.

If any of the blood cells from an Rh D-positive baby get into the blood of an Rh D-negative woman, she will react to the Rh D positive antigen in the baby’s blood as an unrecognised substance and she will produce antibodies. We try to prevent the formation of antibodies to Rh D by the use of an injection called anti-D immunoglobulin. Women who are Rh positive do not react in this way.

**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 substance it does not recognise e.g. a virus, vaccine or a different blood group. So if a different type of red blood cell is in your blood stream you may form red cell antibodies against those cells. There are two main ways that different red cells can enter your blood stream: as a result of a blood transfusion or during pregnancy.

The information in this booklet is only about the anti-D red cell antibody.
During pregnancy it is common for a small amount of the baby’s blood to become mixed with the mother’s blood, this normally happens when the baby is being delivered. Mixing of the mother and baby’s blood can also be caused by an ‘event’ in pregnancy e.g. during an amniocentesis test, if there were any vaginal bleeding during pregnancy and sometimes happens for unknown reason; the greatest risk of this happening for an unknown reason is in the last trimester of pregnancy.

If you form anti-D antibodies they can cross from your blood stream in to your baby’s blood. The antibodies could damage your baby’s red cells if your baby is Rh D positive. In most cases the baby does not come to any harm.

However if the level of anti- D antibodies does becomes high it can sometimes cause serious problems; a baby, if Rh D positive, can become very anaemic* either while still in the womb or after delivery and jaundice** can develop after birth. This condition is known as ‘haemolytic disease of the fetus or new-born’ and must be closely monitored. In England and Wales, about 500 babies develop this condition each year.

If a woman forms an anti-D antibody she becomes ‘sensitised’ and the level of antibody is likely to increase with each pregnancy if she is carrying another Rh D positive baby.

Notes
*Anaemic: This means that there the level of red blood cells in the blood is lower than normal.

** Jaundice: Can occur for a variety of reasons in a newborn baby and is a common, usually harmless condition. It causes a yellowing of the skin and the whites of their eyes; this is due to the build up of a yellow substance in the blood called Bilirubin which is produced when red blood cells break down. In some cases if the level of bilirubin is high treatment is required. See NHS Choices section on ‘Jaundice, newborn’ for more information.
Diagram reproduced from: National Blood Service ‘Blood groups and red cell antibodies in pregnancy

How red cell antibodies are formed during pregnancy

- Mother’s red blood cells
- Baby’s red blood cells
- Mother’s antibody

A. This baby has a different blood group from its mother. You can see this from the in the mother and the in the baby.

B. A baby’s blood can cross through the placenta into its mother’s blood. In this picture the baby’s blood is now in the mother, along with her own blood. In rare cases, her body recognises these cells are different and makes antibodies to fight them.

C. Antibodies can move across the mother’s placenta into the baby’s blood. The baby’s blood cells can be damaged if they have the matching blood group.
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.

All Rh D negative women are offered and encouraged to have antenatal anti-D prophylaxis & post natal anti-D prophylaxis following delivery of an Rh D positive baby. The injection will not cause harm to your baby. Prophylaxis is the word given to a medicine that is used to prevent something happening.

The use of antenatal prophylactic anti-D in the last trimester of pregnancy is recommended by the National Institute for Clinical Excellence (NICE).

The injection is given into a muscle; normally it is given in the upper arm.

When will I be given Anti-D?

You will routinely be offered an anti-D injection routinely at 28 weeks of pregnancy and within 72 hours of birth, if your baby is Rh D positive.

During the antenatal period it is important that any blood tests being sent to the Blood Transfusion laboratory are done before you have the anti D injection; this blood test is known as a ‘group and screen’ test.

Please ensure you know when your 28 week anti-D is due, it is important that you are given it.

After delivery it is very important that you have the anti-D within 72 hours if your baby is Rh D positive; if your baby’s blood group is still unknown when you are going home, please make sure you know the arrangements to find out what it is & where you will be given the anti-D (if required) before leaving the hospital.
If you are Rh D negative you may need an additional anti D injection following any of these events (your doctor or midwife will advise you):

• Hospital treatment for miscarriage or threatened miscarriage
• Abdominal injury
• Vaginal bleeding
• Some diagnostic tests such as amniocentesis
• Turning of your baby by a health care professional.

The injection should be given within three days of an event which might have caused a ‘mixing’ of the baby’s blood with the mothers, but it can work up to 10 days later if this is not possible. The injection does not affect the baby.

**Are there any risks of having Anti-D?**

Very occasionally women can experience an allergic reaction; there have been rare cases of women having anaphylactic (severe allergic) type reactions.

If you have had an allergic type reaction to a blood product or immunisation in the past, please inform your midwife.

In the extremely unlikely event of you having an allergic or anaphylactic type reaction the midwife/ health care professional administering the injection will be trained in the correct procedure to follow and will commence the appropriate treatment.

Anti-D immunoglobulin is made from a part of the blood called plasma that is collected from donors. The production of anti-D immunoglobulin is very strictly controlled and donors are tested to ensure that the chance of a known infective agent being passed from the donor to the person receiving the anti-D immunoglobulin is very low. You may get some local pain or tenderness at the site of injection.
Is the Anti-D injection always effective?
The anti-D injections are very effective at preventing immune anti-D antibodies from forming, but on rare occasions a woman may have an event, which was not apparent, that may mean that they were not fully covered by the effect of the injection. If you experience any problem that may increases the chance of you developing antibodies e.g. unexpected bleeding, you should be given a anti-D injection within 72 hours of that event.

What will happen if I choose not to have Anti-D injections?
Your midwife and Doctor will discuss your decision with you in depth. You will be given the opportunity to discuss your individual concerns/situation and to ask any questions you may have. They will explain further the risks of not having Anti-D injections. If you decide not to have the Anti-D this will be clearly documented in your patient records. If you develop an antibody during pregnancy you will have regular blood tests to monitor the level of antibody and to assess your baby for signs of HDN.

If you develop an antibody we can not prevent the level of antibody increasing by using anti-D injections after you have developed it and this antibody will potentially affect any future pregnancies you may have.

The plasma used in anti-D is derived from human plasma, Jehovah’s Witness patients may wish to discuss the decision of whether they would accept or refuse anti-D injections with a representative from the Jehovah’s Witness Hospital Liaison network. Anti-D is not considered to be a primary blood component by Jehovah’s Witness, it is considered to be a blood fraction and a matter for the individual’s conscience.
Are there any alternatives are available?
At present there are no available alternatives to Anti-D injections derived from human plasma. It is hoped that in the near future we will be able to offer a simple blood test for all Rh D negative women, which would determine your baby’s blood group. Then only women we knew for certain were having a Rh D positive baby would need Anti-D injections. The National Blood Service (NHSBT) is undertaking research to assess whether such a test could be routinely offered to all Rh D negative women.

Why might I not need the injection?
• If your blood group is Rh D positive

• If you already have developed immune anti D antibodies: if you already have immune anti D antibodies the injection would not stop the level of antibody increasing with subsequent pregnancies or remove those antibodies.

Where can I get more information?
If you require any further information please do not hesitate to talk to your midwife or doctor.

• A summary of the key recommendations of the NICE technology appraisal on Pregnancy (rhesus negative women) - routine anti-D (review). It is written for patients, carers and those with little medical knowledge. www.nice.org.uk/guidance/index.jsp?action=download&o=41694


• NHS Choices - www.nhs.uk/conditions/rhesus-disease/pages/prevention.aspx
These resources were used as references when developing this booklet.

**Contact details**

Telephone: 0845 1555 000

Address: University College Hospital
Elizabeth Garrett Anderson Wing
235 Euston Road
London NW1 2BU

Website: www.uclh.nhs.uk