



Platelet antigens and antibodies in pregnancy

Important patient information

This leaflet explains the blood test results that you have been given and what this means to you and your baby. It contains information about the significance of platelet antigens and antibodies in a condition known as Neonatal Alloimmune Thrombocytopenia (NAIT).

What are platelets?

Platelets are the smallest type of cells that circulate in the blood and are important in preventing and stopping bleeding. Sometimes, blood contains fewer platelets than normal, a condition known as Thrombocytopenia.

What is a platelet antigen?

Every platelet has natural proteins on its surface and incorporated into these are the Human Platelet Antigens (HPA). As of 2013, there are 28 known HPAs (e.g. HPA-1, HPA-2, HPA-3, etc.) but scientists are discovering new ones all the time. The HPAs are similar to, but distinct from, the antigens on red cells. Some readers will have encountered red cell antigens already – these are also known as blood group antigens. All HPAs exist in two forms; a high frequency form designated 'a' and a low frequency form designated 'b', e.g. HPA-1a and HPA-1b.

How platelet antigens are inherited

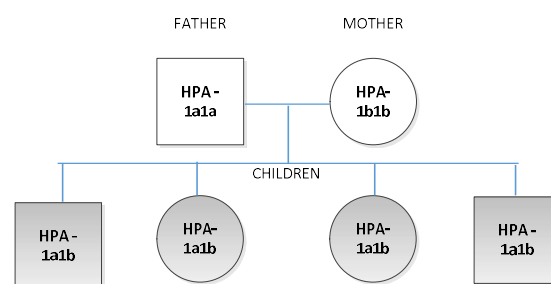
HPAs are inherited characteristics and each child inherits half of their HPAs from each parent. For example, a child may inherit HPA-1a from the mother and HPA-1b from the father and their type would be HPA-1a1b. Alternatively, the child might inherit HPA-1a from both the mother and the father and would be HPA-1a1a.

The diagrams illustrate how HPA-1 is inherited. The square boxes indicate males; circles indicate females. The orange shaded

boxes indicate potentially affected children; clear boxes indicate unaffected children.

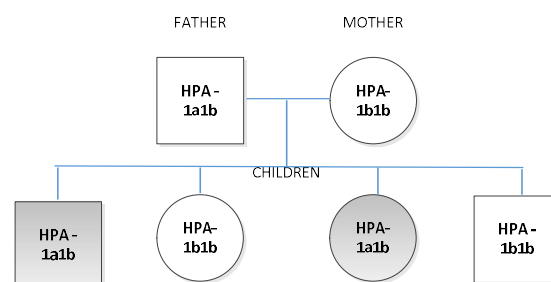
example 1

The mother is HPA-1b1b and the father is HPA-1a1a. In this case, the children from this partnership will always be HPA-1a1b and are all at risk of being affected by NAIT.



example 2

The mother is HPA-1b1b and the father is HPA-1a1b. In this case, the children may be either HPA-1a1b or HPA-1b1b depending on whether the baby inherits HPA-1a or HPA-1b from the father. There is a 50% chance that a child will inherit HPA-1a and be at a risk of NAIT.



What are antibodies?

Antibodies are an important part of the body's immune system, which help us fight disease. They are formed when the body's immune system comes into contact with a 'foreign' substance, for example bacteria, viruses, a vaccination or, during pregnancy or transfusion, a different HPA.

How are platelet antibodies formed during pregnancy?

During pregnancy, some of the baby's platelets may pass into the mother's bloodstream. If the baby's HPA is different from the mother's HPA, her immune system may 'see' the HPA on baby's platelets as 'foreign' and make antibodies that bind to the HPA and destroy the baby's platelets. These antibodies are called HPA antibodies or anti-HPA.

In the majority of cases, differences in HPA between mother and baby do not cause the mother to make HPA antibodies and there are no problems. However, some differences in HPA are more frequently associated with antibody information.

How do platelet antibodies affect pregnancy?

HPA antibodies made in the mother can cross the placenta and enter the baby's bloodstream. When the HPA antibodies come into contact with the baby's platelets they can damage or destroy them. This causes the number of platelets (known as the platelet count) in the baby's blood to decrease. This condition is known as Neonatal Alloimmune Thrombocytopenia or NAIT, and occurs in approximately 1 in 1,000 pregnancies.

In the UK, - 80% of NAIT cases are caused by anti-HPA-1a, - 15% by anti-HPA-5b and -5% by other antibodies.

How does NAIT affect my baby?

The effect on your baby depends on how many of baby's platelets are damaged or destroyed. In mild cases, it might not affect your baby at all. In severe cases the damage to your baby's platelets can cause severe bleeding, which may have serious effects to your baby's health.

How are babies with NAIT treated?

Once the condition is recognised or suspected, your baby can be given a transfusion of platelets that have a similar HPA type to that of the mother. This is the most effective treatment, as it increases the number of platelets in your baby's blood with platelets that will not be destroyed by the HPA antibodies.

What happens afterwards?

The number of platelets that your baby has will gradually return to normal within a few days or weeks after birth. After that, your baby's blood will be entirely normal, and he or she should have no future problems.

Can platelet antibodies affect my health?

HPA antibodies will not affect the platelets in the mother's blood. They need to be taken into account, however, when selecting suitable blood if a blood transfusion is ever needed. This is why you (the mother) will receive a card, which identifies which HPA antibodies have been made. This card should be kept safely and shown to the medical staff that may be treating you.

What happens to the antibodies in my blood?

Once the antibodies are made, they may stay in the mother's blood for a long time, sometimes for life.

What about future pregnancies?

If a mother has had a baby affected by NAIT, any future pregnancies may also be at risk of NAIT and this will largely depend on the HPA type of the father. For example, if the father is HPA-1a1a, there is a 100% chance of the baby inheriting HPA-1a and being at risk of NAIT (see example 1). Alternatively, if the mother makes HPA-1a antibodies and the father is HPA-1a1b, there is a 50% chance of the baby being affected by NAIT (see example 2).

If you have had a previously affected baby and become pregnant again, you should ask your GP or obstetrician to arrange for you to be referred to a Fetal Medicine Unit (FMU). This will enable the pregnancy to be closely monitored and, if necessary, for any treatment to be given to the unborn baby.

Further Information

If you have questions about the information in this leaflet, or if there are things that worry you, please ask your doctor or midwife.

You may also find these links useful:

www.naitbabies.org
info@naitbabies.org

Additional sources of Information

If you are interested in finding out more about blood transfusion and have access to the internet, you may find the following websites useful:

Welsh Blood Service

www.welshblood.org.uk

NHS Choice

www.nhs.uk/conditions/blood-transfusion

UK Transfusion Services

www.transfusionguidelines.org.uk

NHSBT

www.blood.co.uk

For additional copies of this leaflet and for any further information please contact the Welsh Blood Service on 01443 622126.

Acknowledgements to NHS Blood and Transplant for the original content of this leaflet.



Welsh Blood Service

0800 252266

welsh-blood.org.uk

Data protection

The Welsh Blood Service keeps a record of all the tests it performs and any advice it offers to your healthcare team, to run its service efficiently and safely. Your data will be held securely and in accordance with your rights under data protection legislation.

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

