Guideline for the management of the baby with a positive Coombs’ test.

Ownership: Leeds Teaching Hospital Trust
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Aim
To establish clear and simple guidance for the management and investigation of newborn infants with a positive Coombs test.

Objectives
- To understand the pathophysiology behind a positive Coombs test
- To understand the mechanisms behind a positive Coombs test
- To enable sound evaluation of the Coombs positive patient
- To streamline ongoing investigation of the Coombs positive infant

Introduction
Coombs’ test (direct Coombs’ test [DCT] or direct antiglobulin test [DAT]) is a simple and elegant test invented by Robin Coombs, Professor of Immunology in Cambridge in 1945.

A positive Coombs’ test means that there is an antibody attached to the baby’s red blood cells. The antibody will have come from the maternal circulation. In some cases the antibody will lead to fetal and neonatal haemolytic disease.

The most important cause of neonatal haemolytic disease is Rhesus D alloimmunisation. The key to prevention of this condition is avoidance of maternal immunisation. Mothers who are known to be Rhesus D negative are now given passive immunisation with anti-D globulin during any pregnancy. It is normal for there to be small feto-maternal blood leak during pregnancy, and particularly during delivery. This fetal blood may immunise the mother to Rhesus D. Passive immunisation of the mother will remove any Rhesus D positive cells from the fetus without the mother showing an active immunological response. This management has almost eradicated the previously severe condition of Rhesus D haemolytic disease of the newborn.

However, the anti-D administered to the mother will cross the placenta and, if the fetus is Rhesus positive, small amounts will attach to the fetal red blood cells. This does not lead to fetal haemolytic disease, but it will give a positive Coombs’ test in the newborn infant. This can make interpretation of a positive Coombs’ test difficult.

It follows that:
- Most infants with a positive Coombs’ test have no risk of haemolysis as this is simply the result of passive maternal immunisation.

- Babies with haemolytic disease of the newborn have a positive Coombs’ test.

In the newborn baby with a positive Coombs’ test it is important to make an assessment. Is the baby’s positive Coombs’ test simply the result of maternal passive immunisation? Is this a baby with a positive Coombs’ test because of maternal alloimmunisation to the Rhesus D antigen, or one of the other rhesus antigens or one of the other red blood cell antigens?

**Golden rules**

The baby with a positive Coombs’ test is most unlikely to have haemolytic disease and no further action is needed if all of the following apply.

1. Mother has had anti-D antibody passive immunisation before birth.
2. Mother has no rising titre of anti-D antibody during pregnancy.
3. Mother has no antibody titre against other red cell antigens (eg, c, E, Kell etc)
4. Baby is not jaundiced or has mild physiological jaundice or jaundice controlled by single phototherapy at more than 24 hours of age. [Jaundice requiring phototherapy within the first 24 hours should be assumed to be pathological and may be due to haemolysis. ]
5. Baby is not clinically anaemic or has a normal haemoglobin on testing.

If all five rules are met then no investigation is required, reassurance can be given and we can explain that it is most unlikely but possible that jaundice will occur. If a baby goes on to develop severe jaundice, it will be necessary to have blood tests to look for anaemia and the mother or midwife noting the jaundice should refer back to the neonatal service.

**Audit and monitoring.**

In line with departmental and trust policy this guideline will be audited 6 months after publication.
GUIDELINE

DCT +VE
BABY

If before discharge, noted to be jaundiced at less than 24 hours of age

No

Yes

Investigate for early jaundice including haemolytic disease

All 5 rules:
Mother rule 1
rule 2
rule 3
Baby rule 4
rule 5

Meets all 5 rules

No action

Reassure

Explain: It is most unlikely but possible that jaundice will occur. If a baby goes on to develop significant jaundice it will be necessary to have blood tests to look for anaemia and the mother or midwife noting the jaundice should refer back to the neonatal service. Haemolytic disease, if all five rules are met, is most unlikely.

Note: It is not necessary for DCT positive babies to remain in hospital for observation.
Record:

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Clinical condition: Coombs positive neonatal jaundice

Target patient group: Newborns

Target professional group(s): Health professionals working with newborn infants

Adapted from:

References:

Textbook of Neonatology, Ed Rennie and Roberton, 4th Ed.