1 STANDARD PROTOCOLS

1.9 MANAGEMENT OF WOMEN WHO HAVE RhD NEGATIVE BLOOD GROUP

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Authorised by: OGCCU
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1.9.2 THE KLEIHAUER TEST

OVERVIEW

The Kleihauer Test is used to identify women with a large fetomaternal haemorrhage (> 6 mL of packed fetal red cells) who may need ADDITIONAL doses of RhD Immunoglobulin (RhD-Ig) to ensure clearance of all fetal red cells. A negative Kleihauer Test indicates that one dose of RhD-Ig is sufficient.

A standard CSL 625 IU dose of RhD-Ig is sufficient to destroy 240 fetal red cells / 50 low power fields (LPF), which is equivalent to a 6 mL bleed of packed fetal red cells. For Kleihauer counts > 240 fetal cells/50 LPF a repeat Kleihauer Test is required 48 hours after administration of RhD-Ig to ensure effective prophylaxis.

For antepartum Kleihauer Tests, the result may stay positive in cases where the fetus is Rh(D) negative even though one or more doses of RhD-Ig have been given. In these cases, TM will liaise with the physician.

INDICATIONS FOR PERFORMANCE OF THE KLEIHAUER TEST

ROUTINE KLEIHAUER TESTING

All non-urgent Kleihauer Tests are batched and processed once per day.

- Kleihauer Tests are routinely indicated for:
    - For Rh(D) negative women, following a potentially sensitising event (eg. birth of a Rh(D) positive baby, amniocentesis, antepartum haemorrhage, successful or unsuccessful ECV,) to ascertain whether **additional** doses of RhD-Ig are required.
    - Following an unexpected/unexplained stillbirth, prior to the commencement of induction procedure.

A KLEIHAUER TEST SHOULD NOT BE REQUESTED IN THE SETTING OF AN ANTEPARTUM HAEMORRHAGE IN ORDER TO DIAGNOSE ABRUPTION. THIS IS AN INAPPROPRIATE USE OF THE TEST.

URGENT KLEIHAUER TESTING

The indications for an urgent Kleihauer Test are rare. **Such requests shall be accompanied by a phone call from the ordering clinician to Transfusion Medicine (TM).**

An **urgent** Kleihauer test should be ordered **ONLY** in the following situations:

- Significant maternal abdominal trauma, when the CTG is not reassuring and/or the fetus is inactive on ultrasound.

- Non immune fetal hydrops in association with an abnormally raised MCA PSV.
- Sinusoidal fetal heart rate trace in a non-immunised woman.
- Decreased fetal movements after two consecutive non-reactive CTGs and/or an inactive fetus on ultrasound. NOTE: If the first CTG shows a sinusoidal pattern then the Kleihauer Test can be requested immediately.

TESTING AT THE TIME OF BIRTH / POSTPARTUM

Maternal sample

- A pre-delivery Group & Hold sample (a kleihauer is **not** performed on this sample) should be collected and sent to haematology for testing on admission to the Maternal Fetal Assessment Unit/ Labour and Birth Suite (or the Pre-Admission Clinic if an elective Caesarean section birth is planned) if:
    - atypical red cell antibodies are present,
    - the woman's serological history is unknown,
    - prophylactic RhD-Ig has been given in the previous 3 months,
    - there is an increased risk of requiring a blood transfusion.
- In order to determine the extent of the FMH and therefore the appropriate dose of RhD-Ig, a maternal Kleihauer sample must be taken from all Rh(D) negative women who have given birth to a Rh(D) positive infant and who do not have preformed immune anti-D antibodies.
- Ideally, the sample should be routinely collected a ***minimum of 15 minutes*** after placental separation and ***preferably within 2 hours*** to allow sufficient time for any fetal red cells to be dispersed in the maternal circulation.
- In exceptional circumstances, Kleihauer Tests may be collected up to 72 hours after the event but this increases the risk that that any additional doses of RhD-Ig needed for large FMH will not be administered within the required 72 hours.
- If the FMH is greater than 6mL of Rh(D) positive packed fetal red cells, TM will contact the ward and supply additional doses of RhD-Ig as required. A negative Kleihauer Test indicates that one dose of RhD-Ig is sufficient.

CORD SAMPLE

A cord blood sample is collected from all babies born at KEMH and sent to TM.

A request for blood group and a Direct Antiglobulin Test (DAT) should be made for all infant's born to a mother who:

- is Rh(D) negative or,
- has known clinically significant antibodies or,
- has unknown maternal blood group and antibody status.

Where the cord sample is Rh(D) positive and the mother is Rh(D) negative, RhD-Ig will be supplied by TM for administration to the mother without delay.

A request for a blood group and DAT should be made for all infants with unexplained neonatal jaundice and, where the DAT is positive, a bilirubin estimation should be performed on the cord blood. In addition, a haemoglobin level should be determined on a peripheral blood sample taken from the infant.

Note: When a Rh(D) negative mother receives RhD-Ig during pregnancy, especially as routine prophylaxis at 28-30 and 34-36 weeks gestation:

- **the Rh(D) positive infant may be born with a positive DAT but have no evidence of haemolysis and**
- **the maternal sample will often show anti-D reactivity, as the half-life of passive RhD-Ig in the absence of significant FMH, is approximately 21 days.**

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