

1 ANTEPARTUM CARE

1.9 BLOOD GROUPING AND ANTIBODY SCREENING

1.9.1 BLOOD GROUPING AND ANTIBODY SCREENING DURING PREGNANCY

OBJECTIVES

To determine the woman's ABO and Rh(D) blood group and to detect the presence of red cell antibodies the primary aim of which is to:

- identify women found to be alloimmunised so they may undergo close serological follow up and fetal assessment;
- identify Rh(D) negative women who may require the administration of prophylactic RhD immunoglobulin (RhID-Ig);
- identify antibodies with the potential to cause haemolytic disease of the newborn (HDN) and
- provide compatible blood for intrauterine transfusion when required.

ANTENATAL TESTING PROTOCOLS (SEE ALSO TABLE 1)

Initial visit

At the first visit, current group and antibody screen (G&S) results are required on ALL pregnant women, regardless of blood type. If a copy of this report does not accompany the woman to her first antenatal visit, a blood sample should be taken for this purpose before she leaves the clinic.

Subsequent visits

1. Refer to Clinical Significance of Antibodies in this guideline if clinically significant antibodies are detected.
2. Rh(D) negative women should attend KEMH's antenatal clinic at 28-30 weeks gestation for administration of Rh-Ig unless administration is arranged by their GP. Shared care women who have had a G&S performed outside KEMH at 28 weeks, should have a copy of the report sent to Transfusion Medicine (TM). Provided the outside G&S is current (within two weeks of the request for RhD-Ig TM will then issue RhD-Ig for administration in the clinic. If the woman's results are unavailable, a G&S should be sent to TM where, upon receipt of the sample, RhD-Ig immunoglobulin will be issued.
3. All Rh(D) negative pregnant women attending KEMH at 36 weeks gestation will be offered RhD-Ig. This will be issued by TM. A G&S request is only required if the patient has not had previous testing performed during the current pregnancy.
4. It is essential that all relevant information is provided on the request form accompanying blood samples to TM, including:
 - Previous history of transfusion or pregnancy.
 - Previous history of antibodies, especially if reported at an outside facility.
 - Gestation.
5. Dates of any prophylactic RhD-Ig administered in the last 3 months, especially if given at an outside facility.



Table 1

ANTEPARTUM BLOOD GROUPING AND ANTIBODY SCREENING AT KEMH.

		Gestation			
		1 st visit 19-20 Weeks	28-30 Weeks	36 weeks	On admission
Rh(D) POSITIVE	ANC women	G&S (if no current results)			G&S if appropriate*
	Shared care women	G&S (if no current results)			G&S if appropriate*
Rh(D) NEGATIVE	ANC women	G&S	G&S Prophylactic anti-D	Prophylactic anti-D	G&S
	Shared care women	G&S (if no current results)	G&S (if no current results) Prophylactic anti-D	Prophylactic anti-D	G&S

* A pre-delivery G&S sample should be collected on admission to the Labour and Birth Suite (or the Maternity Ward if elective Caesarean section birth is planned) if:

- atypical red cell antibodies are present,
- the woman's serological history is unknown,
- prophylactic anti-D immunoglobulin has been given,
- increased risk of requiring a blood transfusion.



CLINICAL SIGNIFICANCE OF ANTIBODIES

Haemolytic disease of the newborn

Antibodies that cause haemolytic disease of the newborn (HDN) are reactive by the Indirect Antiglobulin Test and are IgG. They can be grouped according to their likelihood of causing haemolytic disease of the newborn as follows:

1. Antibodies most commonly associated with some degree of HDN

- Anti-D, -c, -E, -e, -C, -K and -k antibodies. Anti-D, anti-c and anti-K antibodies are most often associated with moderate to severe HDN.

2. Antibodies not usually associated with HDN, but occasionally can be implicated when the IgG component is of sufficiently high titre

- Anti-C^w, -Fy^a, -Fy^b, -Jk^a, -Jk^b, -Lu^a, -Lu^b, -S, -s, -M antibodies.

3. Antibodies not associated with HDN

- Anti-P₁, -N, -Hl, -Le^a, -Le^b, -Le^{a+b}, -Sd^a, -Bg^a, -Bg^b, and other HLA antibodies.

4. Fetal and neonatal disease caused by maternal anti-K antibodies.

This is atypical in that:

- previous obstetric history is not predictive of disease severity,
- there is poor correlation between antibody titre and outcome,
- spectrophotometric estimation of bilirubin concentration underestimates the severity of the disease and
- hyperbilirubinaemia is not a feature of the disease in affected neonates.

It is hypothesised that erythroid suppression rather than haemolysis is the predominant mechanism causing anaemia.

The following is recommended for monitoring women with anti-K antibodies:

- Check the paternal K antigen status (if K negative, treat as for a normal pregnancy).
- If the paternal phenotype is K positive, refer to the Maternal Fetal Medicine Service.
- If the fetus is K negative the woman will be treated as for an unaffected pregnancy.
- If the fetus is K positive and fetal anaemia is present an intrauterine transfusion protocol should be proposed.

PRINCIPLES OF MANAGEMENT OF ISOIMMUNISATION

1. If clinically significant antibodies are detected at the first antepartum visit, these antibodies will be identified and a titration performed. Thereafter antibody investigation and titration should be repeated every 4 weeks until 36 weeks gestation and then every 2 weeks until delivery.
2. A clinically significant rise in the antibody titre will assist the clinician in determining when to initiate fetal monitoring, such as Doppler ultrasound and cordocentesis.
3. The Maternal Fetal Medicine (MFM) Specialists should perform an antepartum assessment of the severity of the haemolytic disease of the fetus and newborn (HDFN). The following are indications for referral to a MFM specialist:



4. An antibody that may cause haemolytic disease of the newborn with the titre reaching or exceeding 1:16 or increasing by two dilutions.
5. All women who have had an infant previously affected by HDN. These women should be referred to a specialist as soon as possible and preferably before 20 weeks gestation irrespective of antibody level. The partner's blood group and genotype should be obtained as early as possible in the pregnancy.

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