

Anti-D Immune Globulin

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Preamble

Guidelines outline recommendations, informed by both the best available evidence and by midwifery philosophy, to guide midwives in specific practice situations and to support their process of informed decision-making with clients. The midwifery philosophy recognizes the client as the primary decision maker in all aspects of her care and respects the autonomy of the client (1).

The best evidence is helpful in assisting thoughtful management decisions and may be balanced by experiential knowledge and clinical judgment. It is not intended to demand unquestioning adherence to it's' doctrine as even the best evidence may be vulnerable to critique and interpretation.

The purpose of practice guidelines is to enhance clinical assessment and decision-making in a way that supports practitioners to offer a high standard of care. This is supported within a model of well-informed, shared decision-making with clients in order to achieve optimal clinical outcomes.

Preamble

Hemolytic disease of the newborn (HDN) occurs when maternal antibodies cross the placenta with the purpose to inactivate fetal and neonatal red blood cells (2). The majority of cases of HDN occur when a mother with Rho(D)-negative blood is sensitized to Rho(D)-positive proteins from a fetomaternal hemorrhage (FMH) during a current or previous pregnancy and/or birth with an Rh-positive baby. Maternal D-antibodies attack any fetal red blood cells (fRBC) that possess the D protein, thus destroying them. Maternal antibodies that remain in fetal circulation at the time of birth will exasperate this condition in the neonate. Mild asymptomatic anemia, severe anemia, jaundice, fetal hydrops, recurrent miscarriages, and stillbirth are results associated with HDN (3).

Quantitative serum analysis is required to detect these fetal proteins in maternal blood, thereby allowing for prophylactic or sufficient treatment if a fetus or neonate is at risk for or affected by HDN (4). Kleihauer testing has been the most common method of examining maternal serum, though a new technique using free fetal cell DNA found in maternal circulation from apoptotic syncytiotrophoblasts is shown to be > 99% accurate, as well as cost effective (4)(5). Prophylactic treatment of HDN involves maternal administration of Anti-D Immune Globulin (Anti-D IG) in pregnancy and shortly following birth to non-sensitized mothers. Once an Rh-negative mother is sensitized to D-proteins, Anti-D IG is ineffective (6). Treatments conducted by fetal-maternal medicine specialists for affected fetuses involve serial amniocenteses, serial maternal titers, and intrauterine transfusions (3).

Prevalence

Rh-negative blood is most prevalent among Caucasian populations, 15% of whom are Rh-negative (6). Only 7% of the African American population and 1-2% of Asian and Native populations are Rh-negative (12).

Incidence

Though most pregnancies result in a FMH < 0.05 mL, often too small to elicit an immune response, anti-D alloimmunization (sensitization) occurs in 12-13% of untreated Rh-negative women who become pregnant with or give birth to Rh-positive offspring (6). This risk decreases to 1-2% if an appropriate dose of Anti-D IG is administered within 72 hours postpartum. Administration of Anti-D IG at 28 weeks gestation in addition to the early postpartum period causes a declination of risk to 0.1% (6).

Definition

Anti-D IG (WinRho) is purified human immunoglobulin (6). Anti-D antibodies are collected from selected plasma donors; thus Anti-D IG is a blood product. There have been no reports of contamination with the Canadian use of WinRho as viruses such as HIV, Hep A, Hep B, Hep C, and Parvovirus B19 are filtered and/or inactivated (6).

Recent research suggests that the mechanism of Anti-D IG is two-fold (7). Anti-D IG binds to D-protein-fRBC found in maternal circulation lysing them immediately, preventing further immune response to affected fetal cells. The immune globulin also causes significant increase in cytokines and prostaglandin E2 resulting in an inhibition of immune response to D-antigens.

Contraindications (6)

- Allergic or sensitive to human immune globulin
- Deficient immune globulin A (IgA) levels

Technique (6)

- Intramuscular and intravenous administration
- IM administration in hip area is most common.

Adverse Reactions (6)

- More common: discomfort, light swelling of injection site, increase in temperature
- Less common: back pain, pallor, cyanosis
- Possibility of infectious disease transmission due to nature of product

Dosage Guidelines (8)(9)

PRENATAL SCREENING

	600 units (120 micrograms)	1500 units (300 micrograms)
CVS < 12 weeks*	✓	
CVS > 12 weeks*		✓
Amnio < 34 weeks*		✓
Amnio > 34 weeks	✓	
Cordocentesis (any time)*		✓

* Re-administer Anti-D IG q 12 weeks up to birth

FIRST TRIMESTER*

	600 units (120 micrograms)	1500 units (300 micrograms)
Spontaneous, therapeutic, or threatened abortion < 12 weeks**	✓	
Ectopic or Partial Molar***	✓	
Pregnancy < 12 weeks		
Abruption, trauma****	✓	

*All women should be screened for blood type, Rh-factor and antibodies at first prenatal visit. Weak-D genotype (Du-positive) does not require Anti-D IG during pregnancy

**If type and screen information is unknown at the time of an event that could produce an FMH, testing should be carried out

***Anti-D IG not required for complete molar pregnancy

**** Maternal serum should be re-screened to ensure sufficient dosage of Anti-D IG

SECOND/THIRD TRIMESTER

	600 units (120 micrograms)	1500 units (300 micrograms)
At 28 weeks* **		✓
Spontaneous, therapeutic, or threatened abortion > 12 weeks		✓
Ectopic or Partial Molar Pregnancy > 12 weeks		✓
Abruption, trauma, ECV***		✓

*Antibodies should be rechecked at 26 weeks to ensure sufficient dose of Anti-D IG

**Subsequent dose at 40 weeks is not required if Anti-D IG given no earlier than 28 weeks

*** Maternal serum should be re-screened to ensure sufficient dosage of Anti-D IG

BIRTH/POSTPARTUM*

	600 units (120 micrograms)	1500 units (300 micrograms)
Within 72 hours of birth with quantitative testing**	✓	
Within 72 hours of birth w/o quantitative testing***		✓

*98.5% of FMH at birth are < 2.5 mL fRBC (10)(11)

**Where FMH > 6mL fRBC, an additional 10 micrograms of Anti-D IG is required for every 0.5 mL fRBC

***Where FMH > 15mL fRBC, an additional 10 micrograms of Anti-D IG is required for every 0.5 mL fRBC

Responsibilities Associated with Anti-D IG

- Discuss benefits, risks, and contraindications of Anti-D IG with client
- Verbal or written informed consent must be obtained and documented prior to administration
- Epinephrine: 0.3 mL of 1:1000 concentration should be available at time of dosage due to remote possibility of anaphylactic reaction; to be administered subcutaneously
- Ensure sufficient dosage provided to client throughout duration of pregnancy and early postpartum period

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