RHOCLONE

Rh Incompatibility

The Role of Rho(D) Immune Globin (RhIG)

Rhesus Factor

- The term **Rhesus (Rh) blood group system** refers to the 5 main Rhesus antigens (C, c, D, E and e) as well as the many other less frequent Rhesus antigens.
- The terms **Rhesus factor** and **Rh factor** are equivalent and refer to the **Rh D antigen** only.
- Individuals either have, or do not have, the **Rhesus factor** (or Rh D antigen) on the surface of their red blood cells.

Basics Of Rh Factor

Mother
Rh-ve

Father
Rh+ve

Child
50% chances of
Rh+ve

Facts behind Rh Factor .....

- When Mother is Rh-ve, Father is Rh+ve and Baby is Rh+ve
- The fetal RBCs are separated from the mother’s circulation by the layer of cells in the placenta called trophoblast.
- However during late pregnancy and especially during childbirth the fetal RBCs may escape into mother’s circulation
- Once these cells reach the mother’s circulation, they are perceived as an antigen and thus can provoke an antibody response

Rh factor causes HDN

- Antibodies to fetal RBCs are not usually made before first childbirth
- Repeated pregnancies provoke high antibody levels in the mother
- Maternal IgG antibodies can cross the placenta and reach the fetal circulation
- They react with fetal RBCs and cause their destruction and eventually death

DANGERS OF HDN

BEFORE BIRTH

- Antibodies cause destruction of the red cells
- Anemia – reduction in number of RBCs
- Heart failure
- Fetal death

DANGERS OF HDN

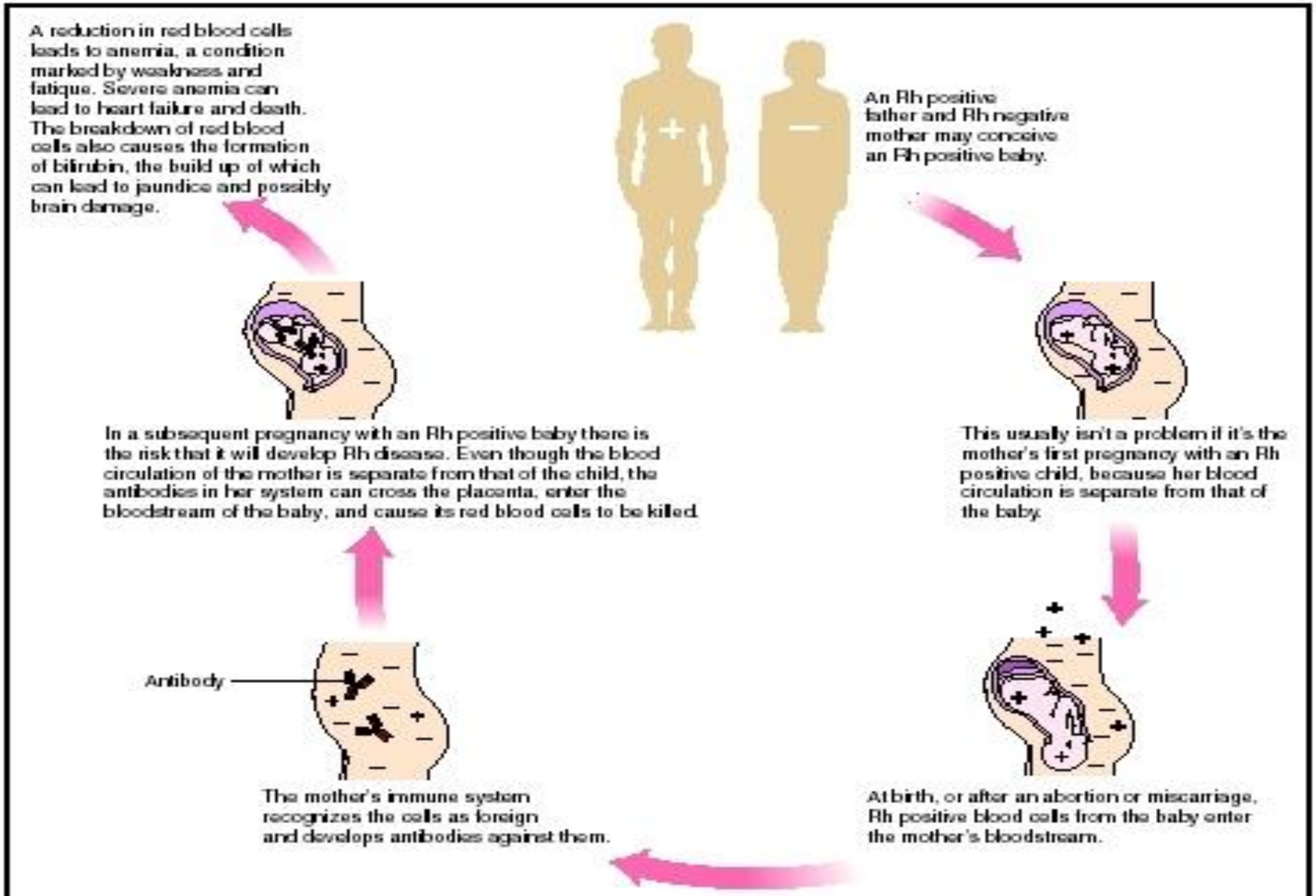
AFTER BIRTH

- Antibodies cause destruction of the red cells
- Anemia – reduction in number of RBCs
- Build up of bilirubin – yellowish pigment in bile
- Jaundice
- Hepatomegaly – enlargement of liver
- Splenomegaly- enlargement of spleen
- Kernicterus – parts of brain and spinal cord are infiltrated with bilirubin
- Severe retardation
- Heart failure

WHAT IS FMH?

- FMH is fetomaternal hemorrhage
- FMH means the amount of blood passing from the fetus to the mother
- FMH can be calculated by the Kleihauer Betke test

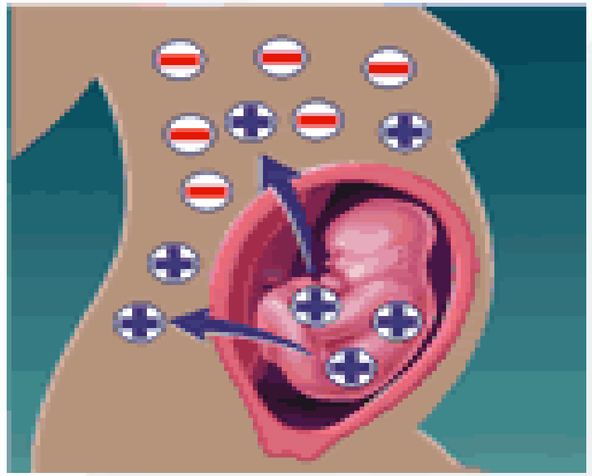
How Does FMH take place???



What is FMH

- Fetomaternal hemorrhage (FMH) is a common occurrence most often associated with small volumes of blood transferred across the placenta.
- Fetomaternal hemorrhage leads to sensitization of Rh D-negative mothers, resulting in an increased risk of hemolytic disease of the newborn.
- FMH can be calculated by the

  Kleihauer Betke test

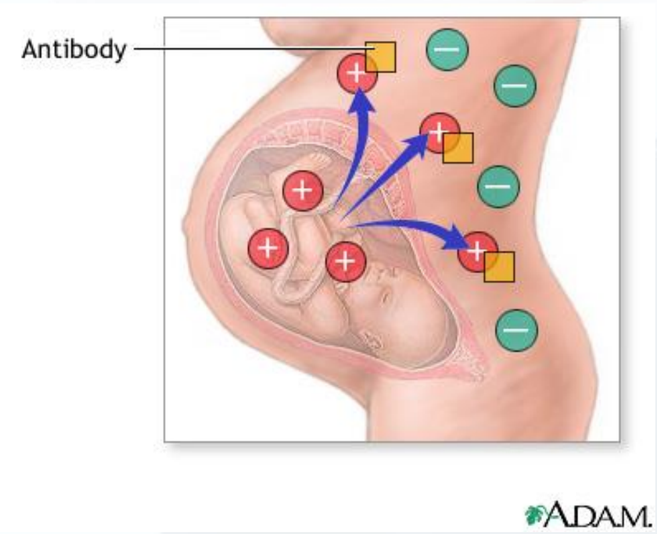


IS POSTPARTUM IMMUNIZATION ENOUGH?

- 1.6-1.9% of Rh negative women become immunized inspite of postpartum administration of anti D
- This is due to a large amount of FMH at delivery or during pregnancy
- The FMH during pregnancy is called as silent bleed.
- This could happen due to abdominal trauma, injury etc during pregnancy
- 3% of pregnant women have FMH in the first trimester, 12% in the second and 45% in the third

HOW TO TAKE CARE OF SILENT FMH?

- A single injection of 300 mcg of anti D at 28 weeks gestation provides protection for 12 weeks
- A further injection of 300 mcg within 72 hrs of delivery of Rh positive infant will protect most non immunized Rh negative mothers
- This is known as antepartum prophylaxis
- 300 mcg of anti D neutralizes ml of positive red cells or 30 ml blood



What Is Anti-D?

- Anti- D is an antibody against D Epitope present on fetal RBC, so as to prevent the Rh –ve women from sensitization.

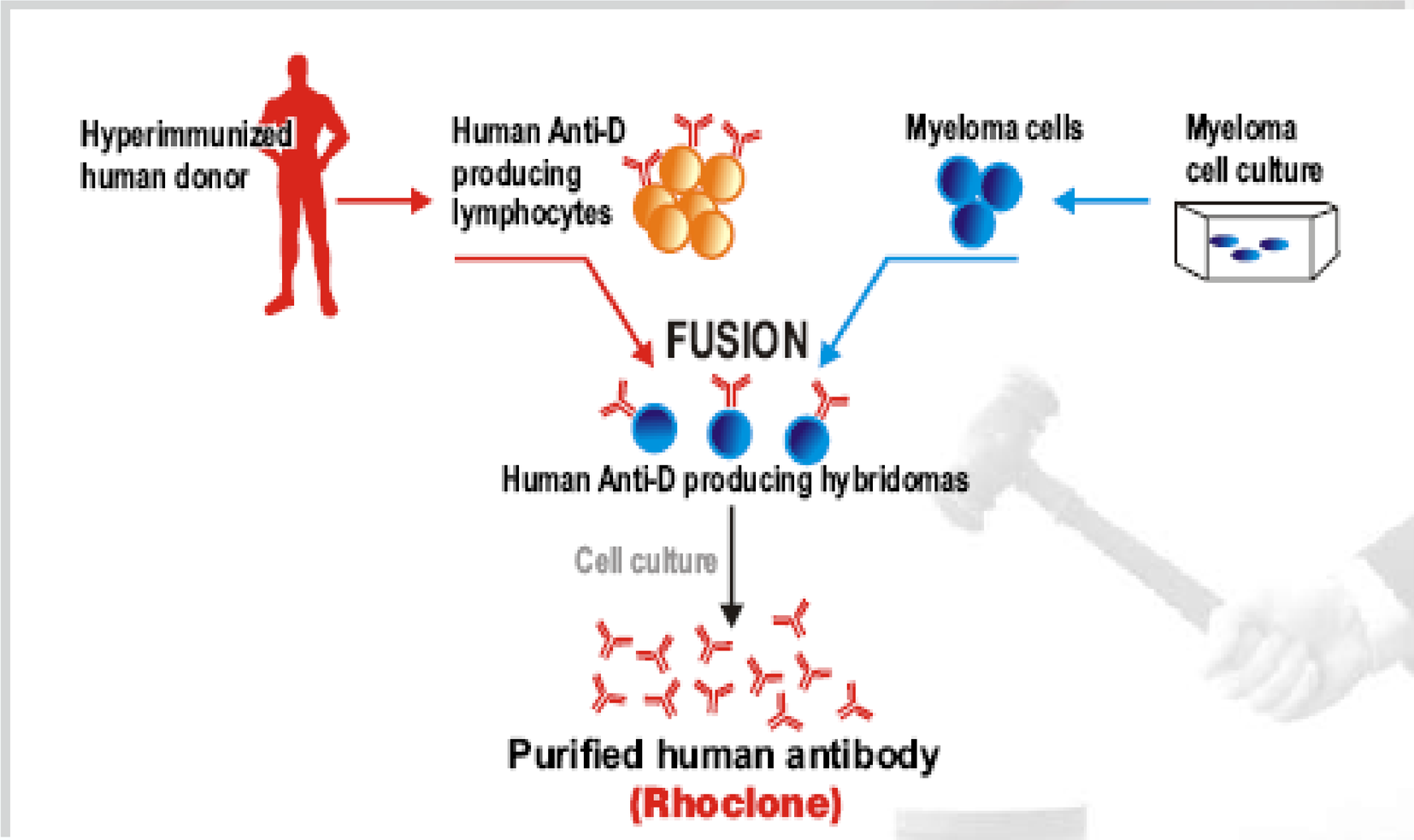
What Is Monoclonal Antibody???

- Highly specific antibodies against single antigenic epitope produced by the clone of a single hybrid cell formed in the laboratory by the fusion

What Is Rhoclone???

- MONOCLONAL Anti- D Immunoglobin highly specific against D epitope on Fetal RBC

Manufacturing Process



Monoclonal advantage

- Specificity
- Uniformity
- Consistency
- Safety from emerging viruses

Efficacy

- Rate of red cell clearance – The ability of Rhoclone to clear the D positive RBCs through the spleen.
- The study proves that specificity for RHOCLONE is only for sensitized cells and not for non sensitized RBCs. There is complete clearance of sensitized RBCs from spleen within 3 hrs of administration of RHOCLONE

USPs

- No donor pool involved
- No risk of emerging viruses
- No lot to lot variation
- Unlimited supply
- Consistency & uniformity assured

INDICATIONS

- Prevention of HDN
- Antenatal prophylaxis of HDN
- Termination of pregnancy
- Miscarriage
- Abdominal trauma
- External cephalic version
- Ectopic pregnancy

20 mcg of anti D neutralizes 1 ml of Rh positive cells or 2 ml of positive blood

Guidelines

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FIGO GUIDELINE

Obstetrics

FIGO/ICM guidelines for preventing Rhesus disease: A call to action

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Abstract

The introduction of anti-Rh(D) immunoglobulin more than 50 years ago has resulted in only a 50% decrease in Rhesus disease globally owing to a low uptake of this prophylactic approach. The International Federation of Gynecology and Obstetrics, International Confederation of Midwives, and Worldwide Initiative for Rhesus Disease Eradication have reviewed current evidence regarding the utility of anti-Rh(D) immunoglobulin. Taking into account the effectiveness anti-Rh(D), the new guidelines propose adjusting the dose for different indications and prioritizing its administration by indication.

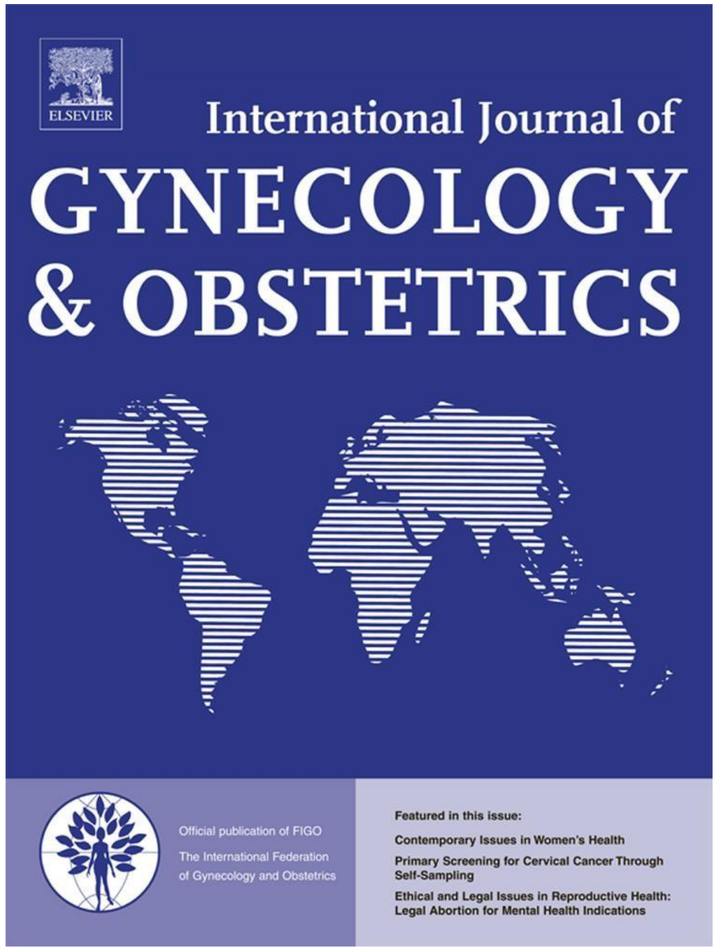
KEYWORDS

Anti-D immunoglobulin, FIGO, Guidelines, International Confederation of Midwives, Prophylaxis, Rhesus disease, Worldwide Initiative for Rhesus Disease Eradication

FIGO/ICM guidelines for preventing Rhesus disease: A call to action

HIGH PRIORITY

- Determine the maternal Rh factor, preferably in early pregnancy.
- For Rh(D)-negative women, determine the Rh factor of the newborn from umbilical cord blood.
- Administer anti-Rh(D) immunoglobulin within 72 hours of delivery to women with a Rh(D)-positive newborn, unless already sensitized.
- Use a dose of 500 IU (100 µg) of anti-Rh(D) immunoglobulin; if affordable and with sufficient supply, 1500 IU (300 µg) may be given, as is common in high-income countries. The intramuscular route is as effective as the intravenous route.



- Visser GHA, Thommesen T, Di Renzo GC, Nassar AH, Spitalnik SL; FIGO Committee for Safe Motherhood, Newborn Health. FIGO/ICM guidelines for preventing Rhesus disease: A call to action. Int J Gynaecol Obstet. 2021;152(2):144-147. doi:10.1002/ijgo.13459

FIGO/ICM guidelines for preventing Rhesus disease: A call to action

MIDDLE PRIORITY

- Routine anti-Rh(D) prophylaxis during pregnancy: 1500 IU (300 µg) at 28–34 weeks.
- Anti-Rh(D) immunoglobulin prophylaxis (500 IU; 100 µg) after a surgical abortion or ectopic pregnancy (all gestational ages), or after spontaneous or medical abortion/miscarriage after 10 weeks.
- Anti-Rh(D) prophylaxis after bleeding, abdominal trauma in pregnancy, and/or fetal death (500 or 1500 IU; 100 or 300 µg) during the second or third trimester. Kleihauer–Betke test can be used to estimate the optimal dose.

LOW PRIORITY

- Anti-Rh(D) prophylaxis after amniocentesis, chorionic villus sampling, or external cephalic version (500 IU; 100 µg).

- Visser GHA, Thommesen T, Di Renzo GC, Nassar AH, Spitalnik SL; FIGO Committee for Safe Motherhood, Newborn Health. FIGO/ICM guidelines for preventing Rhesus disease: A call to action. Int J Gynaecol Obstet. 2021;152(2):144-147. doi:10.1002/ijgo.13459

Latest KOGS recommendations on Rh disease - 2023

Journal of Obstetrics and Gynaecology of Eastern & Central Africa PERSPECTIVE

Rhesus isoimmunization: An underappreciated reproductive risk

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Leaders in obstetrics practice from various African countries met towards the end of last year to discuss the unmet need to address the burden of Rhesus disease. They noted that, despite being entirely preventable, Rhesus disease was identified as one of the roadblocks to achieving maternal universal health coverage. The team recommended all stakeholders to facilitate access to anti-D immunoglobulin and screening tools for widespread screening and treatment.

- Moses M. Obimbo, Kireki Omanwa. Rhesus isoimmunization: An underappreciated reproductive risk. JOGECA | Vol. 35 | No. 2 | June 2023 | 58

Latest Tanzania MOH recommendations on Rh disease - 2021

MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT,
GENDER, ELDERLY AND CHILDREN

STANDARD TREATMENT GUIDELINES AND NATIONAL ESSENTIAL MEDICINES LIST FOR TANZANIA MAINLAND

THE UNITED REPUBLIC OF TANZANIA

Investigations

- Maternal Blood group+ Rhesus factor
- Paternal blood group+ Rhesus factor
- Infant Cord blood at delivery for grouping, FBC, Coombs test to detect maternal antibodies and Total Billirubin

Prevention of Rhesus isoimmunisation

If the mother is Rhesus negative give

C: anti D immunoglobin 300microgram within 72hours of delivery

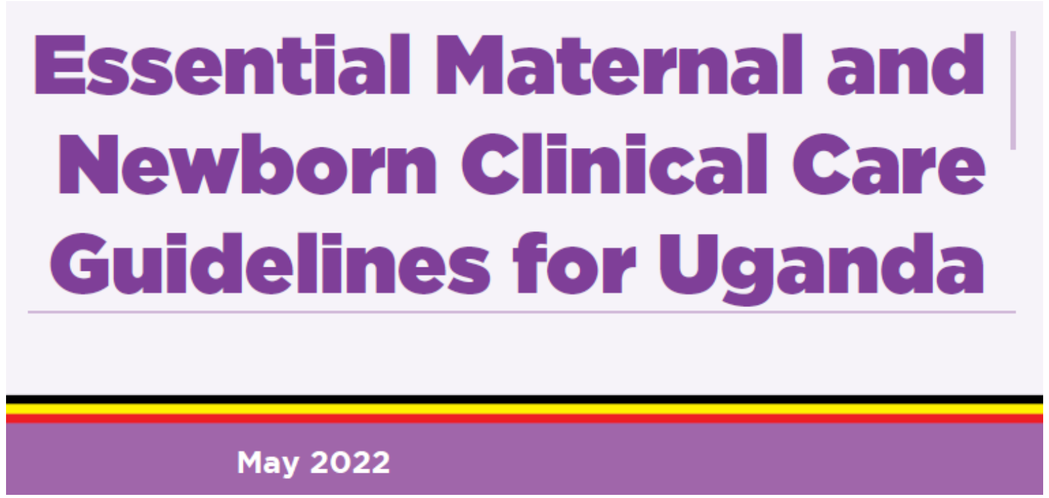
Antepartum

C: anti D immunoglobulin (IM)at 28-32weeks of gestation

Abortion in Rhesus negative mother give

C: anti D immunoglobulin 100microgram (IM) within 72hours of abortion

Latest Uganda MOH recommendations on Rh disease - 2022



THE REPUBLIC OF UGANDA
MINISTRY OF HEALTH

Investigations to Ensure the mother is "Fit for Labour"

- Blood haemoglobin level
- Blood grouping and cross-matching and Rhesus factor (for high-risk mothers)
- Urinalysis: protein, sugar and acetone

Gestational age 26-37 weeks

- Rhesus negative mothers should receive anti-D immunoglobulin 300mg

Conclusion

- Rh isoimmunization is a real problem and real efforts need to be made to mitigate its impact
- Although its incidence has decreased dramatically, yet the consequences of haemolytic disease of the newborn remain.
- Every woman of childbearing age should have her ABO and Rh types done at first contact
- Obtain the ABO/Rh types for husbands of women found to be Rh-negative.
- Even today a larger number of women, who should be protected against Rh immunization, are not receiving Anti- D.


THANK YOU