29th January 2022

Stillbirth Society of India

International Stillbirth Alliance Member

Theme of the Month:
Stillbirths From Rh-Sensitisation

STILLBIRTH
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From the Editor's Desk

Dear Readers,

The much awaited newsletter by the 'Committee for Study of Stillbirths Due to Rh Sensitisation' is finally released. It has been an honour edit this e-newsletter of the Stillbirth Society of India with interesting articles from stalwarts of the subject. The theme for this e-newsletter is **"Stillbirths From Rh Sensitisation".**

Stillbirths due to Rh allo-immunization remains problematic in resource constrained settings of the developing world. This has largely been reduced in developed countries with successful Rh-D immuno-prophylaxis, intensive fetal monitoring and intrauterine transfusions. The first article, **'Rh-D Alloimmunised Pregnancy: Problem, Management',** discusses the problem and introduces the management of Rh negative pregnancies. The highlight of the article is the summary of scheme of management beautifully explained diagrammatically. The second article, '**Prevention of Rhesus Allo-Immunization in Pregnancy',** deals with preventive aspects of Rh allo-immunization and gives the key clinical points at the end of the article.

The article, **'Middle Cerebral Artery Peak Systolic Velocity and its Role in Rhesus Allo-Immunization',** discusses the role of middle cerebral artery in management of Rh-negative alloimmunised pregnancies. The next article, **'Intrauterine Transfusion To Treat Fetal Anemia Due to Rh Isoimmunization'** takes us through the technical aspects of the procedure. The highlight of this article remains a detailed step by step approach to make intrauterine transfusion easy for readers to comprehend. The article, **'Management of Pregnancy With Rh-D Negative Blood Group'** presents two flow diagrams which succinctly cover all the salient points with respect to management of such pregnancies. We have included a poem in this issue by a renowned obstetrician who presents a unique insight into the life of an obstetrician, **'A Peek Into an Obstetrician's Life'.** The last article entitled, **'Basques-the European Ethnic Group With the Highest Incidence of Rh Negative Blood Group',** is a perfect conclusion of this newsletter which remains an academic treat for readers. Monthly report including proceedings of the Webinar conducted by the Committee and a link to the uploaded programme on YouTube have been summarised at the end.

We wish our readers a happy reading!!!

Dr Ayesha Ahmad

Asso. Prof. [ObGyn], Era's Lucknow Medical College and Hospital

docayeshaahmad@gmail.com

Rh-D Allo-Immunised Pregnancy: Problem, Management

SC Saha [MD, DNB, MRCOG]
Professor , Department of Obstetrics and Gynaecology
PGIMER, Chandigarh

Introduction

Fetal and neonatal haemolytic disease results from maternal allo-immunization to red cell antigens, for which mother and fetus are incompatible. Maternal IgG antibodies pass the placenta into the fetal circulation and cause destruction of fetal red cells. The most prevalent anti-red cell antibodies causing fetal anemia are anti-D, anti-Kell and anti-c.

Global Burden

In the developed countries the incidence of Rh allo-immunization has reduced significantly due to Rh-D immuno-prophylaxis. However, in India, Rh allo-immunization is still a major problem though unrecognised. In the absence of immuno-prophylaxis, 14% of Rh-D-negative women will develop antiD antibody. Allo-immunization rate reduces to 1.8–2% with postpartum prophylaxis.

Added antenatal prophylaxis further reduces the allo-immunization rate to 0.1–0.2% [1]. In India, there is no direct information from population-based studies about the extent of the problem of Rh-D allo-immunization.

A recent study calculated the number of pregnant women likely to develop Rh-D allo-immunization in India from the prevalence of Rh-D negativity, estimated number of pregnant women at risk and units of Rh-D immunoglobulin utilized. Five percent of Indian population was estimated to be Rh-D negative. Nearly 1.3 million Rh-D-negative women were estimated to be pregnant annually, and nearly 1 million of them were estimated to be at risk. Eight lakh women would not receive prophylaxis according to this study and one lakh women were estimated to develop allo-immunization annually [2].

In a hospital based study from Delhi, the prevalence of erythrocyte allo-antibodies was found to be 1.25% in multigravidae who were attending antenatal clinics. Rh-D contributed to 78% of them. The Rh-D allo-immunization rate was found to be 10.4%. Adverse pregnancy outcome was 10 times higher among these women [3]. Similar results have been found in studies from other parts of India [4,5] .

In PGIMER, Chandigarh, between 2006 and 2014, 44145 women delivered; 5.2% were Rh-D negative and 15% allo-immunized. 44% of these women required IUT [6]. From Delhi too, large case series of Rh allo-immunized pregnancies has been published [7]. Thus it seems Rh-D allo-immunization remains a major problem in India.

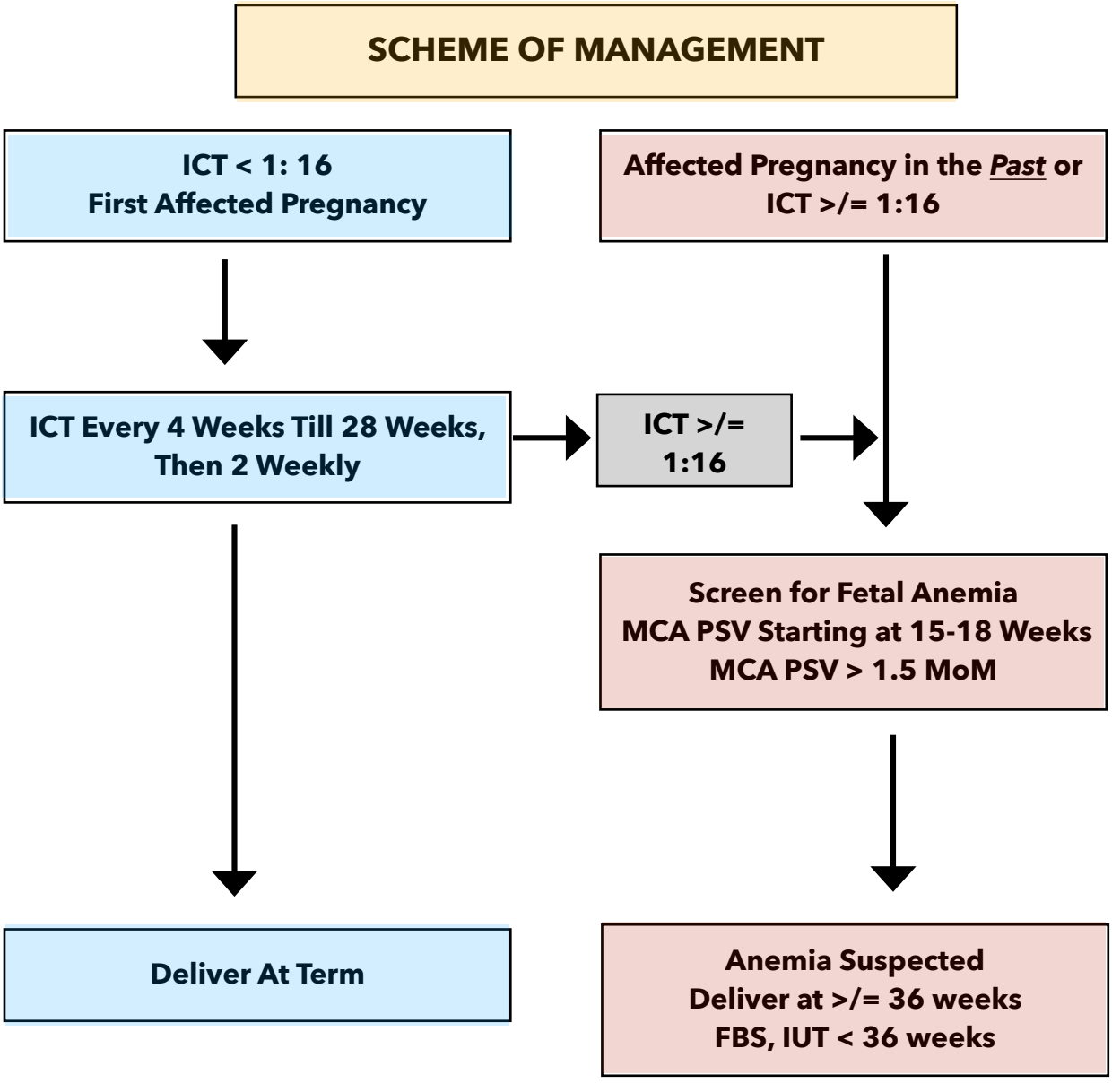
Rh-D allo-immunization results in multiple pregnancy losses due to hydrops, intrauterine fetal death, prematurity, birth asphyxia and severe early onset neonatal jaundice. Need for exchange transfusion, care for preterm deliveries, morbidities related to bilirubin encephalopathy drains economic resources of family and the society.

Largely, it is preventable; though it is not a problem which can be eradicated. While resources should be directed towards its prevention appropriate knowledge of management of Rh-D allo-immunized pregnancies will reduce perinatal morbidity as well morbidity from this disease significantly.

Monitoring of Rh-D Negative Pregnant Women :

All pregnant women must have blood group and Rh-D typing done early in pregnancy. If found Rh-D negative, blood must be tested for atypical antibodies. Indirect Coombs' [ICT] test is performed. Husband's blood group and Rh-D type also needs to be tested.

If ICT is found positive patient needs to be sent to a tertiary care hospital. Type of antibodies present are characterized. Titre of Rh-D antibody is determined. A titre of 1:16 or above puts the patient at high risk of development of fetal anemia and fetal death from severe fetal anemia. Previous bad obstetric history also is an important predictor of severe fetal affection. In case of first affected pregnancy, risk of still birth is 6% in second pregnancy it rises to 29%. In presence of still birth in the past risk rises sharply to 70%.



Scheme of management has been shown above. Intrauterine transfusion [IUT] is a preferred option in case severe fetal anemia is detected till 34 weeks of gestation. Between 34- 36 weeks whether to deliver and give exchange transfusion will vary from place to place depending upon the availability of neonatal care facilities and difficulties in IUT anticipated.

Antenatal Monitoring for Fetal Anemia:

Monitoring with Middle Cerebral Artery Peak Systolic Velocity [MCA PSV] has become the standard practice nowadays to screen for fetal anemia since the landmark paper published by Mari G et al. [8] MCA PSV monitoring is a non-invasive test and can be performed from 15 weeks onwards. It is a highly sensitive test and can diagnose moderate to severe anemia with 12% false positivity rate.

Method Of MCA PSV Monitoring:

Axial section of fetal head below biparietal diameter [BPD] plane during fetal rest is taken. Circle of Willis is imaged. Entire length of MCA seen should be zoomed, sampled close to its origin, angle of insonation should be close to zero. Unnecessary pressure should be avoided. At least three and fewer than 10 consecutive waveforms should be recorded. All should be of equal height. Auto trace is usually preferred. Value obtained is plotted using one of the calculators available online to get [MOM] value for that gestation. [9]

- It is reliable between 15-35 weeks gestation.
- Frequency: 1-2 weeks depending upon risk assessment
- After 35 weeks false positivity increases.

Fetal Blood Sampling and Intrauterine Transfusion:

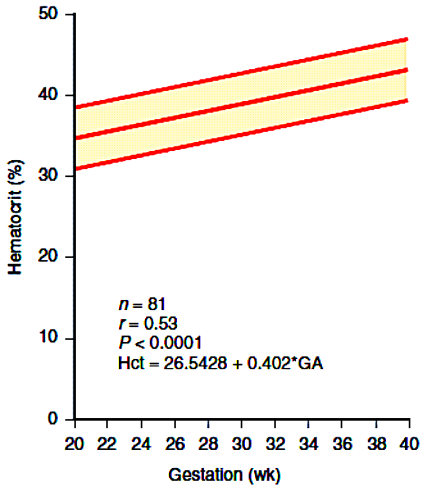
MCA PSV value consistently above 1.5 MOM needs to be followed up with confirmation of fetal anemia by fetal blood sampling, with blood being kept ready for IUT in the same sitting.

Degree of Fetal Anemia Where Transfusion Is Advised:

Recommendations vary. We, in our centre take hematocrit [Hct] value <= 30%, irrespective of gestation as cut off for IUT as suggested by Weiner et al [10]

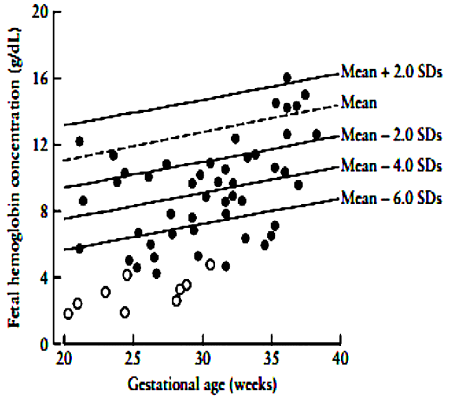
DEGREE OF ANAEMIA REQUIRING TRANSFUSION

- PCV ≤ 30 at any gestation



Weiner, 1991

Hb deficit exceeding 4 g/dl or 4 SD for the gestation. OR -2SD below the mean for gestation (Moise KJ)



• Scheier, 2004

Routes of Transfusion :

Intravascular or intra peritoneal?

Intravascular transfusion is preferred whenever feasible. It corrects anemia quickly. Amount of blood needed to correct anemia can be calculated easily. Hemoglobin [Hb] and Hct value obtained at the end of transfusion help to determine the time of subsequent transfusion.

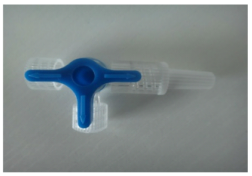
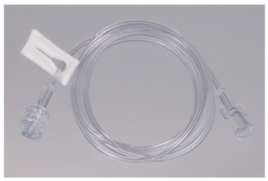
Intravascular Transfusion: Umbilical cord vein at its insertion in placenta or intra hepatic portion of umbilical vein are preferred sites for intravascular transfusion. Free loop of cord is difficult to access and incidence of complications are higher. Occasionally one may need to resort to intra cardiac transfusion. Intra hepatic portion of hepatic vein is preferred site in early gestation and when placenta is posterior. Incidence of fetal bradycardia is lower with this route.

Intraperitoneal or Combined Transfusion?

- In early gestation in absence of hydrops, intraperitoneal transfusion still has a place. Combined blood transfusion may reduce frequency of transfusions too. Absorption from cavity is completed in 7-10 days. Amount of blood given is around 4-5 ml in 16 weeks and then it is increased by 1 ml every week .

EQUIPMENTS FOR TRANSFUSION

- **Chiba needle (20-22 gauge)**, 22 G spinal needle
- Blood transfusion set, 3 way cannula, extension tubing, disposable sterile probe cover, 10 ml syringes preferably with luer lock, 5 ml syringes, EDTA vacutainers
- Xylocaine, Vecuronium, NTG patches - 2
- Keep normal saline, infusion set, venflon ready
- Resuscitation set (intubation set, adrenaline, atropine)

Procedure:

- Daycare case. Take informed consent
- Steroid if plan is to deliver in case of complications
- OT staff and neonatologist to be briefed beforehand
- Check MCA-PSV, estimated fetal weight, general well-being of fetus
- Choose site for IUT
- Sedate mother if anxious
- Sterile field, sterile probe cover.
- Identify each and every medicines to be used

- Once target is fixed Chiba needle 20-22g is advanced into the target under ultrasound guidance. We prefer free hand end on technique.
- Local infiltration is used.
- Fetal paralysis is a must if intra hepatic vein is targeted and intra muscular *Vecuronium* in the dose of 0.01 mg per kg body weight is given via 22g spinal needle.
- In case of umbilical vein intravenous *Vecuronium* is administered through Chiba needle after taking fetal blood sample.
- Fetal blood sample is to be sent for blood group, Rh type, Direct Coomb's Test [DCT], Hb, Hct, platelet count and bilirubin in case of first transfusion.
- In subsequent transfusions fetal blood sample is tested for Hb, Hct and platelet count both before and after transfusion.
- Donor blood
    - Buffy coat poor, saline washed
    - Fresh ($\leq$ 3 days)
    - Irradiated
    - HIV, HbsAg HCV Negative
    - Compatible with maternal blood
    - (O Negative)
    - Packed cell volume [PCV] 70-80%

Amount of Blood To Be Transfused:

Target Hct is 45-55% in absence of hydrops. In presence of hydrops in whom initial Hct is usually <20%, Hct is restored slowly. In first transfusion target PCV is 25-30%. In subsequent transfusion which is given after 2-3 days Hct is raised to around 45%.

Volume of Blood Needed To Be Transfused:

Volume of transfused blood = FP volume (ml) X (Final-initial Hct)/ Hct of transfused blood.

[Feto-placental (FP) volume: 1.046+fetal wt.(gm)x 0.04]

We use simple formula provided by Giannia et al. [12]. When donor blood PCV is 75% then to increase fetal Hct by 10% one needs to transfuse a volume of blood equivalent to fetal weight (gm) x 0.02 = X ml. In hydrops too we use same formula though it is not that accurate. A mid transfusion value gives a clearer picture of amount of blood to be transfused.

Subsequent Transfusion:

When estimated PCV < 25 -30 %, PCV falls from post transfusion value approximately by 1% per day once fetal erythropoiesis is suppressed after 2-3 transfusions. Hb% drops by 0.4-0.3gm % per day.

An MCA-PSV Cut off value of more than1.5 MOM is quite helpful for 2nd and third transfusions. It becomes less reliable subsequently. In our experience both Doppler measurement of MCA-PSV and estimation of the decrease in fetal Hct or Hb can be used to determine the timing of second and subsequent IUTs.

Complications

IUT is a relatively safe procedure.[6,7.13]

- Cord spasm, hematoma
- Intrauterine infection-0.3%
- Preterm pre labour rupture of membranes [PPROM]-0.1%
- Intrauterine fetal death [IUFD]-0.9%
- Emergency Cesarean Section [CS]-2%
- Procedure related Complications were 3.1% (Van kamp et al) [13]

PGI experience [6]

- IUFD-1.6%
- Severe bradycardia-1%
- Abortion-0.6%
- PPROM-0.2%
- Procedure related complications-3.8% in our case series

Delivery

- 37-38 weeks gestation preferred
- CS for obstetric indication
- Two Weeks after last transfusion
- Survival has greatly improved particularly when patient comes early for treatment.
- Overall survival was 90%-93% [6,7,13]. In presence of hydrops, it dropped to 63-67% (6)

Neonatal problems [6]

- Exchange-70%
- Phototherapy-82%
- Top up transfusion-13%
- Iron overload
- Thrombocytopenia-10%
- Prematurity-20%
- Intra ventricular haemorrhage-13%
- Periventricular leucomalacia

Need for exchange has reduced in recent years with intensive phototherapy.

Neuro-developmental delay [LOTUS study][14]

- Cerebral palsy-2.1%
- Developmental delay-3%
- Deafness bilateral-1%
- Overall neuro-developmental impairment-4.8%

Conclusion

- Rh-D allo-immunization is still a significant problem.
- Prevention is best and is feasible
- Awareness of the problem and its management is important
- Women must be referred to appropriate place early in pregnancy

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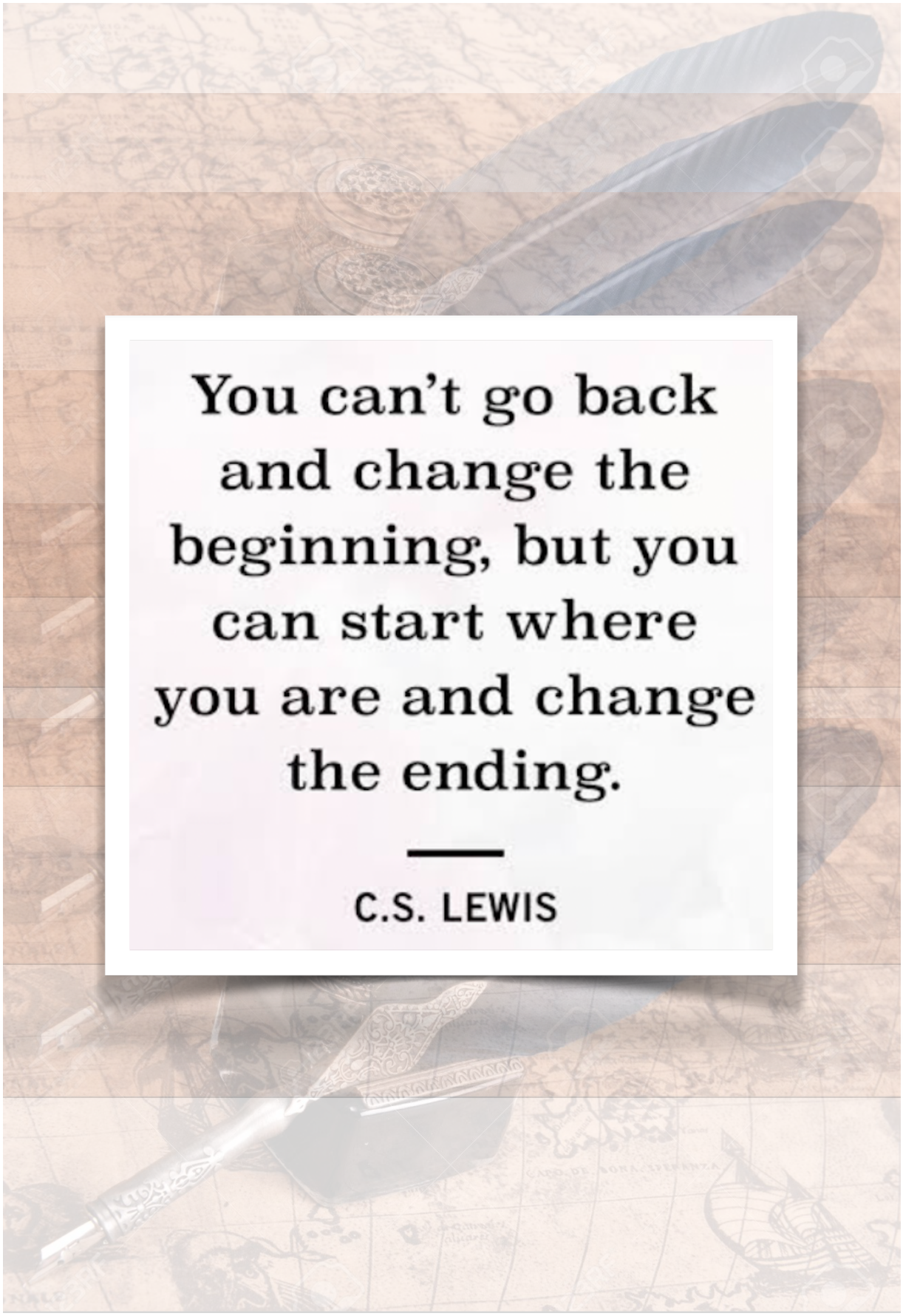
You can't go back and change the beginning, but you can start where you are and change the ending.
C.S. LEWIS

Prevention of Rhesus Allo-Immunization in Pregnancy

Sukumar Barik [MD, DNB, FRCOG]
Professor and Head, Dept of Obstetrics and Gynaecology,
ICARE Institute of Medical Sciences and Research,
Haldia, West Bengal
sukumarbarik1@gmail.com

Introduction

The risk of fetal anemia is greatest with anti-D, anti-c and anti-K antibodies. Other antibodies that potentially cause significant fetal anemia include anti-E, anti-Fya, anti -Jka, anti -C and anti -Ce[1]. Without anti-D prophylaxis, an Rh-D negative woman delivered of an Rh-D positive, ABO compatible infant has a 16 percent likelihood of developing allo-immunization. If there is ABO incompatibility risk is 2 percent.

Global Burden

Even in current years Rhesus disease results in more than 160 000 perinatal deaths and 100 000 cases of disability annually[2]. This gloomy data represents that we achieved only a 50% reduction relative to the era before immunoglobulin administration.

Preventive Strategies

- Postpartum Anti-D
- Routine Antepartum Anti-D
- Anti-D in special situations

Postpartum Anti-D immune globulin

Anti D 300 µg is administered intramuscularly within 72 hours after delivery. This dose is sufficient to neutralize 30 mL of Rh(D)-positive fetal whole blood. Postpartum anti-D immune globulin reduces this risk to approximately 1.5%. In suspected cases of greater amount of fetomaternal hemorrhage, Kleihauer–Betke test may be performed to estimate the actual volume and then additional dose of Anti -D is administered.

Antepartum Anti-D immune globulin

Most of the immunization happens during the process of delivery. However occasionally, it can happen during antenatal period. Routine prenatal administration of anti-Rh(D) immunoglobulin can prevent sensitization resulting from fetal–maternal hemorrhage during pregnancy. It may be given once at 28–34 weeks of gestation (300 micrograms), or twice at 28 and 32–34 weeks. In US,300 micrograms of anti-D immunoglobulin are given at 28 weeks of gestation.

In UK, two doses are administered between 28 and 34 weeks. Routine prenatal administration seems to reduce sensitization to approximately 0.5%.

Anti-D in Other/ Special Situations

Spontaneous miscarriage - Risk for sensitization is extremely low for spontaneous miscarriage before 10 gestational weeks. Prophylaxis should be given in cases of spontaneous miscarriage or medical management of miscarriage after 10 gestational weeks. Before this gestation, cases should be indivualized. In cases of surgical management of miscarriage, it should be considered before 10 gestational weeks.

Ectopic pregnancy: Cases of a disturbed tubal pregnancy has been associated with a 24% incidence of allo-immunization to Rh-D among Rh-D negative women. Therefore, anti-Rh-D immunoglobulin administration is strictly advised for ectopic pregnancy by all authorities and societies.

Other Clinical Conditions Where Anti-D Administration is Recommended

- Abdominal trauma
- Amniocentesis

- Chorionic villous sampling
- External Cephalic Version
- Bleeding in later part of pregnancy (placenta praevia, abruptio placentae)
- Fetal death

Why Still There Is a Significant Non Achievement of the Attainable Target?

- Insufficient supply
- Cost considerations
- Ignorance (e.g., simply forgot to administer anti-D immune globulin)
- Lack of access
- Use of products that have not been tested for therapeutic efficacy

Future Directions

Cell free fetal DNA -

Non-invasive prenatal testing of cell-free DNA in the first trimester of pregnancy may be used to determine fetal Rh(D) status.

A meta-analysis of 60 000 participants showed that it has a very high sensitivity (99.9%; 95% CI, 99.5%–100%) and specificity (99.2%; 95% CI, 89.5%–99.5%) as compared with testing newborn's blood. Population-based cell-free DNA as a method to determine Rh status at present is not cost-effective. However, with more availability of test procure, more use of this technique and gradual cost reduction may change the scenario altogether in near future.

Take Home Message

- Postpatum anti-D immune globulin should be given to unsensitized Rh-D-negative women within 72 hours of delivery.
- Prophylactic routine antenatal anti-D immune globulin (RAADP) should be given to unsensitized Rh-D-negative women at 28 weeks period of gestation.
- Anti-D immune globulin should be given to unsensitized Rh-D-negative women in special situations like, miscarriage, ectopic pregnancy, molar pregnancy, invasive procedures, antepartum hemorrhage, external cephalic version, fetal death and abdominal trauma.
- Our aim should be to eliminate this preventable catastrophy by strict adherence to the current guideline in each and every clinical cases. should be given to unsensitized Rh-D-negative women.

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Middle Cerebral Artery Peak Systolic Velocity and its Role in Rhesus Allo-Immunization

Manisha Madhai Beck [MD]
Professor and Head, Fetal Medicine Unit
Christian Medical College, Vellore
Tamil Nadu
beckmanisha@yahoo.com

Introduction

MCA PSV has been the cornerstone in management of Rhesus alloimmunized pregnancies following the landmark trial by Oepkes D et al . It was a prospective , international multicentric trial which established the superiority of this non invasive method of diagnosing fetal anemia secondary to allo-immunization, over the traditional invasive methods (serial amniocenteses and measurement of delta OD 450).This study showed that MCA PSV had a higher sensitivity (88%versus76%)and accuracy (85% versus 76%)for diagnosing fetal anemia than the invasive method. (1)

Why Does MCA PSV Increase in Fetal Anemia?

Fetal anemia due to any etiology causes a decrease in blood viscosity thereby decreasing the shearing forces in the blood vessels and increasing the MCA PSV .

Rationale Behind Using MCA PSV

To pick up fetuses with severe anemia prior to development of hydrops , which is the end stage condition, and treat them with intra uterine transfusion (IUT).

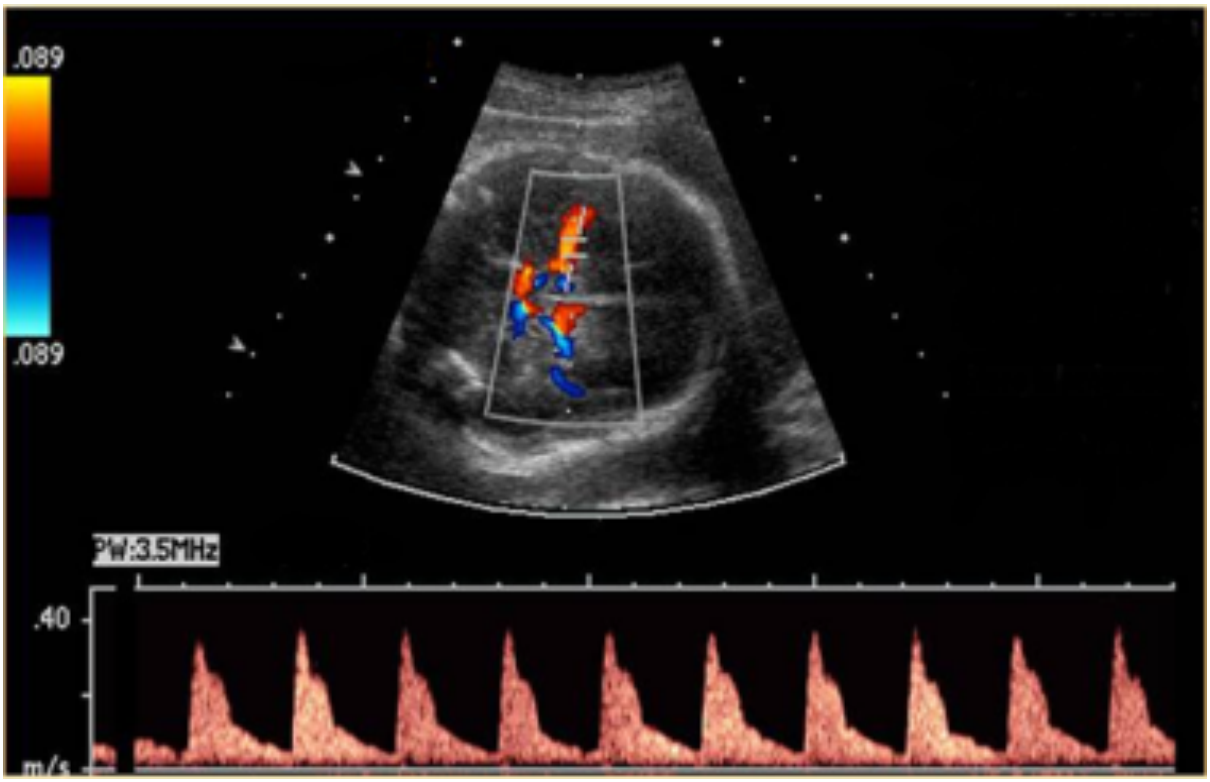
Indication: In all Rhesus alloimmunized pregnancies when maternal antibody titres cross the critical value (1:16 in most labs).

Gestational Age When It Is Done: 18-35 WEEKS. Less than 18 weeks, it is technically challenging to do it . >35 weeks the reliability comes down and it is safer to deliver the baby than give transfusion.

How Is It Done? On 2D Ultrasound Using Colour Doppler.

Steps are as follows:

- Done during fetal quiescence.
- Transverse axial view of fetal head at BPD level is focused.
- Transducer is moved caudally to identify the butterfly shape of the suprasellar cisterns and the sphenoid bone.
- Angle of insonation should be 0.
- Colour Doppler is switched on to visualise the fetal Circle of Willis.
- The MCA close to maternal abdomen is used for measurement.
- Doppler gate placed over the proximal part of the MCA, just after its origin and peak systolic velocity measured.



Measurement of MCA PSV using Colour Doppler. The doppler gate is placed close to the origin of MCA .

What Is Abnormal MCA PSV?

MCA PSV increases with gestational age , hence the value needs to be adjusted for gestation. MCA PSV ≥ 1.5 MoM is predictive of moderate to severe fetal anemia . A rough guide is, if value of MCA PSV in cm/sec is ≥ GA in weeks x 2 , it is abnormal.

False Low Values Are Seen in Following Conditions

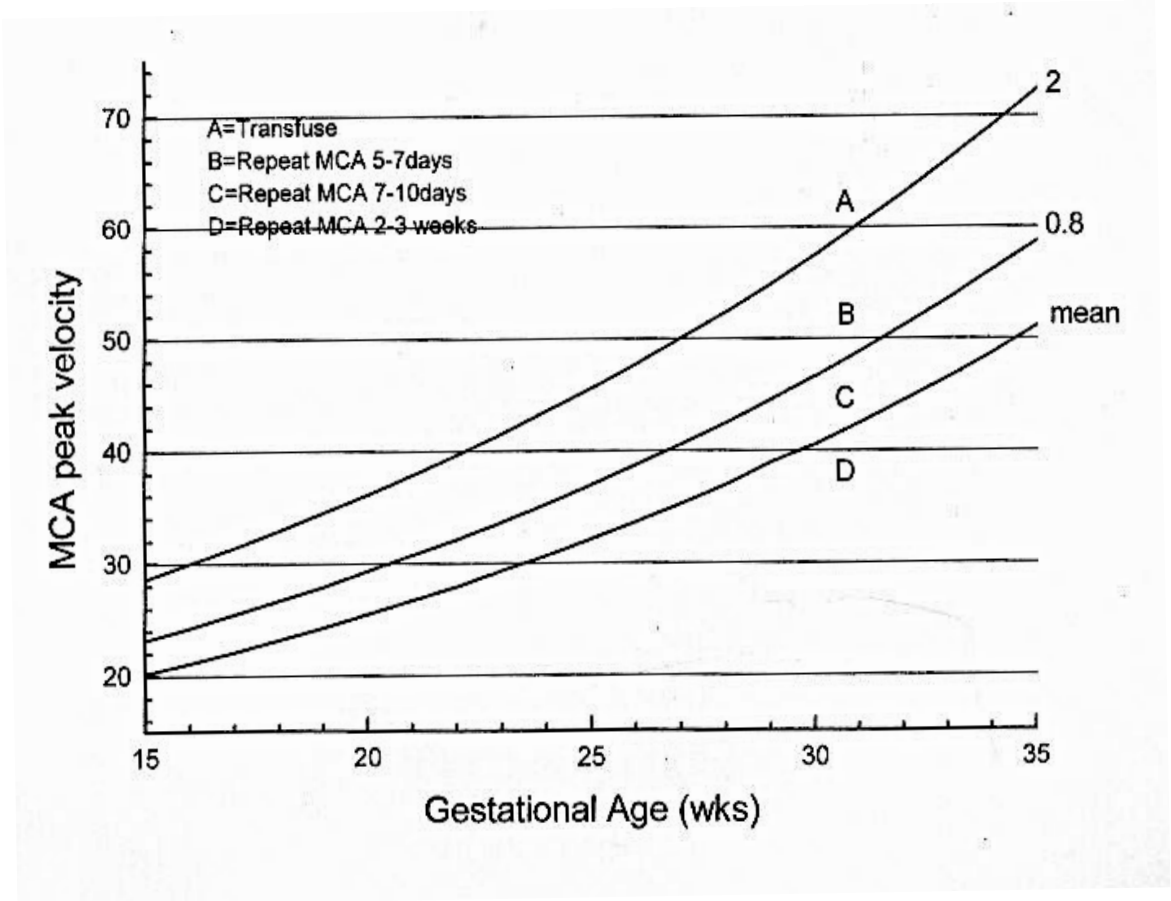
Fetal movements

MCA Doppler measured in the distal part of MCA

Following antenatal steroids (transient effect :lasts for 24-48 hours)

How Frequently Do You Do MCA PSV?

Every 1-2 weeks depending upon the trend of MCA PSV. Mari's chart is a useful guide for guiding this .



Mari's curve: MCA PSV is plotted against GA and it can be used as a guide to decide on follow up

When Do You Deliver if MCA PSV < 1.5 MoM Throughout Pregnancy?

This is suggestive of mild anemia and pregnancy is usually carried on till 37 to 38 after which labour induction is carried out.

How Do You Manage Pregnancies With Abnormal MCA PSV?

GA >35 weeks : Deliver

GA <35 weeks : Cordocentesis is done to check fetal hematocrit (Hct). If Hct <30 or < 2SD of the mean Hct for GA , intrauterine transfusion is given with fresh O neg packed red cells .

What Is the Role of MCA PSV in Managing Pregnancies Post Intra-Uterine Transfusion?

Role is controversial since fetal blood is mixed with adult blood following IUT, MCA PSV may not reflect the true fetal condition. However, most Fetal medicine specialists use this to time the next IUT.

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Intrauterine Transfusion To Treat Fetal Anemia Due To Rh-Isoimmunization

Vatsla Dadhwal [MD]
Professor, Maternal Fetal Medicine
Dept of Obstetrics and Gynaecology,
All India Institute of Medical Sciences, New Delhi
vatslad@hotmail.com

Introduction

Intrauterine transfusion (IUT) of red blood cells is the cornerstone of treatment for fetal anemia due to a variety of causes. It is the most successful of all in-utero therapy. The most common indication in our setting is fetal anemia due to Rh isoimmunization. IUT is done when fetus has moderate to severe anemia.

Moderate to severe fetal anemia is suspected in an Rh isoimmunized mother when middle cerebral artery -peak systolic velocity (MCA-PSV) is ≥ 1.5MOM, and when there is fetal hydrops. Diagnosis of fetal anemia is made when fetal hematocrit (Hct) is less than 30%, hemoglobin is < 0.64 MOM. Fetal anemia is confirmed on cord blood sample, just before transfusion.

Gestation at transfusion

- IUT, by intravascular route can be given after 20 weeks, between 18-20 weeks intraperitoneal route may have a role.
- Last transfusion is usually at 34-35 weeks

Technical aspects

Intravascular approach is preferred via the umbilical vein at placental cord insertion (fig 1) , intrahepatic vein or the free loop. The free loop floats away when needle insertion is attempted and more chances of needle getting dislodged. The advantage of intrahepatic portion of umbilical vein is less chance of fetal bradycardia. Puncturing the umbilical artery is avoided as the vessel may go into spasm causing fetal bradycardia.

Aim of transfusion

Aim is to raise the hematocrit to 45-50%. In severely anemic or hydropic fetus the final post transfusion Hct should not exceed 25% or 4 fold from pre-transfusion value, repeat IUT is performed within 48 hrs to bring Hct to normal range.

Pre requisites

- Informed consent
- Antenatal steroids if gestation above the period of viability
- Check antenatal serology (HIV, HBs Ag, HCV)
- Keep the patient nil by mouth and canulate before the transfusion.
- Preoperative antibiotics and tocolytics as per local protocol
- Arrange blood (see fig 2.on red cell component for IUT)
- Calculate the amount of blood to be transfused (see fig 3.)
- Theatre standby in case of need of emergency caesarean section, in case of fetal distress
- No maternal sedation, local anaesthesia may be used
- Fetal paralysis with vecuronium 0.3mg/kg, pancuronium 0.2mg/kg or atracurim 0.4mg/kg of fetal weight (I/V or I/M), fetal movements can dislodge needle, can lead to cord trauma.

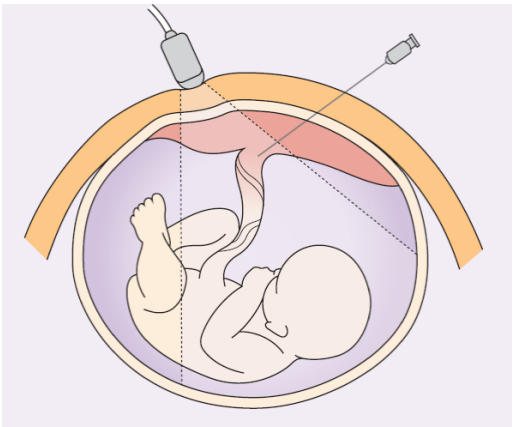

Fig1. Cordocentesis through cord insertion near placenta

Fig. 2: Red Cell Component for IUT

- Plasma reduced (hematocrit 0.7–0.85)
- In citrate phosphate dextrose (CPD) anticoagulant (theoretical risk of toxicity from additive solutions)
- Leucocyte-depleted
- Less than 5 days old (to avoid hyperkalaemia)
- Cytomegalovirus (CMV) antibody negative
- Sickle screen negative
- Irradiated to prevent TA-GvHD (shelf life 24 hours)
- Usually group O negative
- Rh-D and Kell negative and red cell antigen negative for maternal alloantibodies
- Indirect antiglobulin test (IAT) crossmatch compatible with the mother's plasma

Fig. 3: Formulas to Calculate Blood Amount to be Transfused

$$\text{Volume to be transfused (ml)} = \frac{\text{Donor Hct - Desired Hct}}{\text{Desired Hct - Fetal Hct}} \times \text{Fetoplacental vol(ml)}$$

Donor hematocrit should be 75-80%; Desired hematocrit should be 25% for hydropic fetus and 45-50% for the non hydropic anemic fetus

Fetoplacental volume = 150ml/kg compatible with the mother's plasma

Intravascular transfusion (technique)

- Select the access site with ultrasound and color Doppler after confirming the fetal heart activity, and placental site.
- Once the access site and needle path are mapped, fetus is paralyzed by intramuscular injection or injection directly into cord if placenta is anterior.
- A 20 gauge long needle (spinal or CHIBA needle) is inserted under continuous ultrasound guidance by free hand technique.
- The needle tip is inserted with a sharp jerk into the umbilical vein, the stillete withdrawn, 1-2 ml blood aspirated and sent for Hb, Hct and ABO Rh.
- Initial Hb should be assessed rapidly by a bed side analyzer (Hemocue) and volume of blood to be transfused is calculated.
- IUT is carried out at the same sitting if fetal hemoglobin is less than 10gm% or Hct less than 30.
- The needle is connected to the transfusion bag via extension tubing with a 3 way tap and transfused at the rate of 5-10ml/min.
- Look for turbulence in the umbilical vein to confirm correct needle placement.

- Before withdrawing the needle under vision, after transfusing requisite amount of blood, a post transfusion hematocrit is taken and bleeding from cord also checked.
- Fetal cardiac activity is confirmed post IUT .
- The target Hct is usually around 45-50% in non hydropic and 25-35% in hydropic.
- Post transfusion Hct should not be more than 4 times the pre IUT Hct.

Subsequent transfusions

Fetal monitoring is subsequently carried out by ultrasound with MCA-PSV measurements and daily kick count. The last transfusion is usually done at 34-35 weeks, unless technically difficult, so delivery can be at term. Vaginal delivery is not contraindicated.

Timing subsequent transfusions

MCA- PSV is not accurate for timing subsequent transfusions. Subsequent transfusions are timed as per the rate of fall of Hb. Transfuse if it is less than 30%. The rate of decline of Hb 0.4, 0.3 and 0.2 g/dl after first, second and third IUT or transfuse empirically at 10, 14, 21 days for second, third and subsequent IUT. Subsequent transfusions are delayed as more and more fetal RBCs are replaced by adult RBCs, rate of hemolysis decreases.

Complications of IUT

Procedure related complication occurs in 3% and procedure related fetal loss occurs in 1.6%

Transient bradycardia is common, bradycardia leading to caesarean delivery can occur in 0.1%, there can be preterm labour, preterm premature rupture of membranes

Outcomes after IUT

Overall, neonatal survival is 84%, 70% for hydropic and 94% for non-hydropic fetuses.

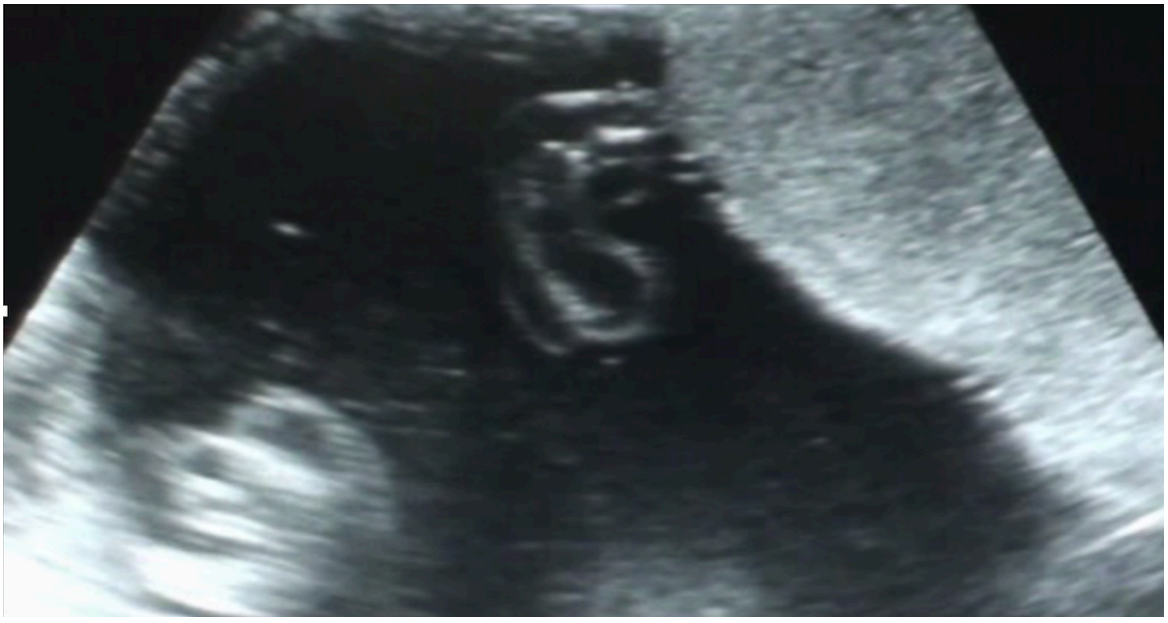

Fig 4: Needle in UV, Anterior Placenta, Turbulence From Transfused Blood

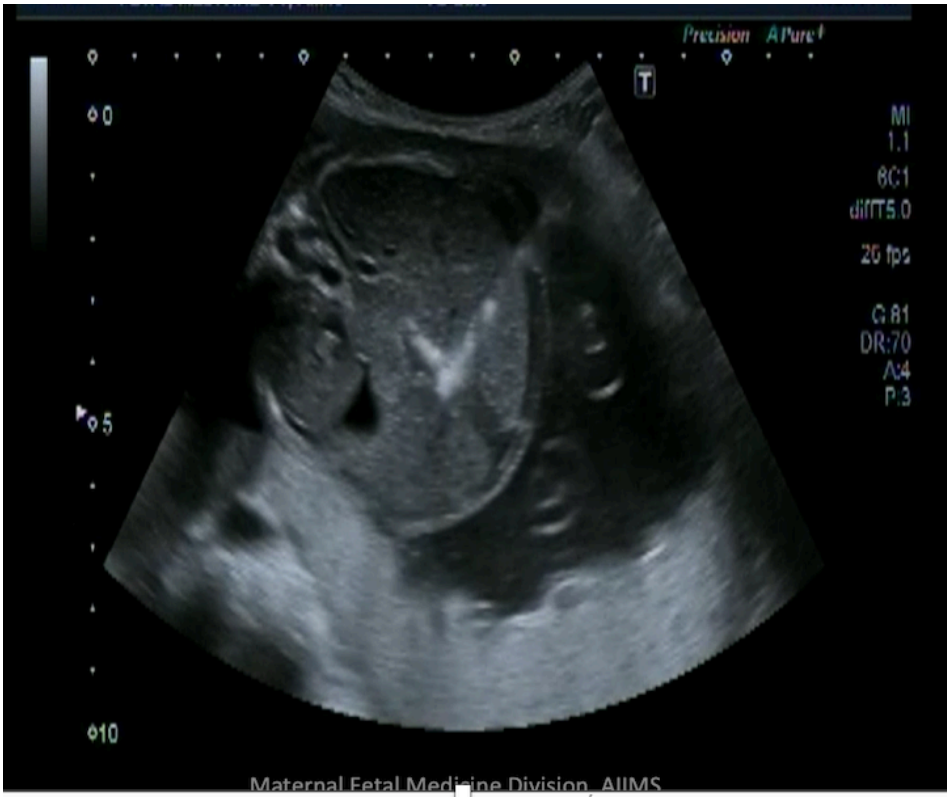

Fig 5: Needle in Intrahepatic Part of UV

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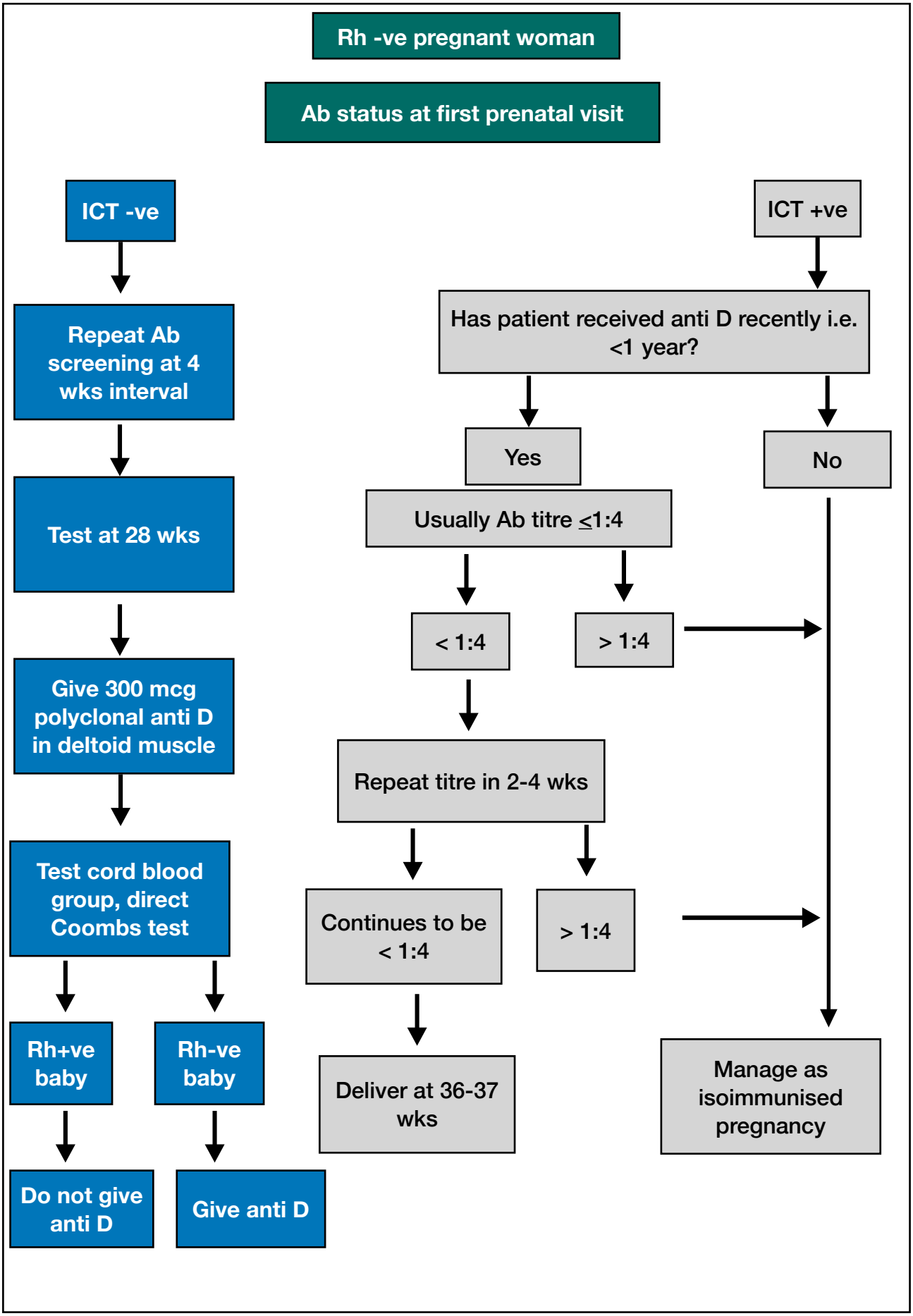
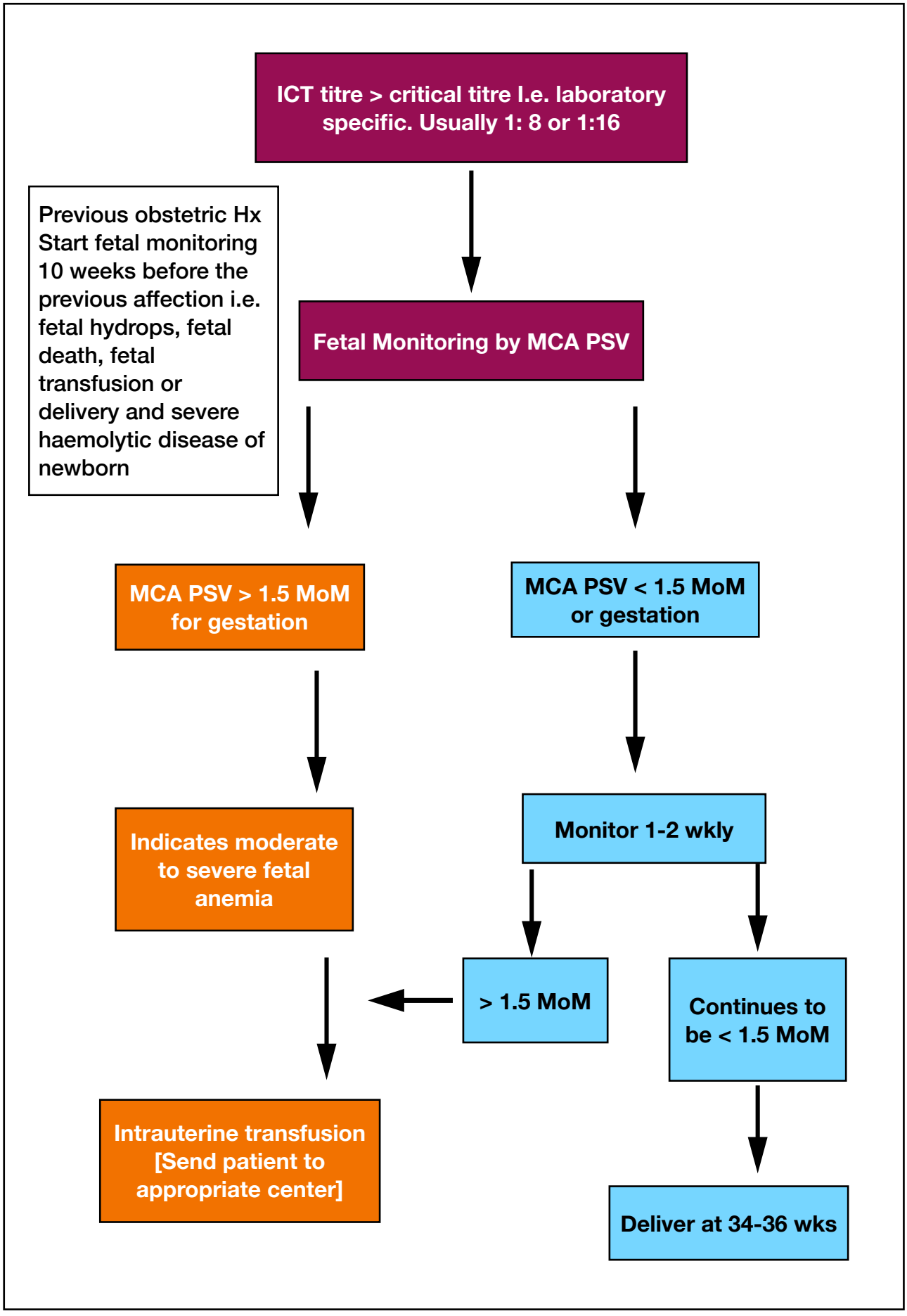
Management of Pregnancy With Rh-D Negative Blood Group

Mandakini Pradhan
Professor and Head, Department of Maternal and Reproductive Health, SGPGIMS, Lucknow.
Chairperson, Committee for Study of Stillbirths Due to Rh Sensitisation, SBSI
mandakini@sgpgi.ac.in

Naini Tandon
Consultant, Obgyn
Tandon Clinic, Lucknow
Secretary,Committee for Study of Stillbirths Due to Rh Sensitisation, SBSI
drnainitandon@gmail.com


Rh -ve pregnant woman
Ab status at first prenatal visit
ICT -ve
Repeat Ab screening at 4 wks interval
Test at 28 wks
Give 300 mcg polyclonal anti D in deltoid muscle
Test cord blood group, direct Coombs test
Rh+ve baby
Rh-ve baby
Do not give anti D
Give anti D
ICT +ve
Has patient received anti D recently i.e. <1 year?
Yes
No
Usually Ab titre ≤1:4
< 1:4
> 1:4
Repeat titre in 2-4 wks
Continues to be < 1:4
> 1:4
Deliver at 36-37 wks
Manage as isoimmunised pregnancy


ICT titre > critical titre I.e. laboratory specific. Usually 1: 8 or 1:16
Previous obstetric Hx Start fetal monitoring 10 weeks before the previous affection i.e. fetal hydrops, fetal death, fetal transfusion or delivery and severe haemolytic disease of newborn
Fetal Monitoring by MCA PSV
MCA PSV > 1.5 MoM for gestation
MCA PSV < 1.5 MoM or gestation
Indicates moderate to severe fetal anemia
Monitor 1-2 wkly
> 1.5 MoM
Continues to be < 1.5 MoM
Intrauterine transfusion [Send patient to appropriate center]
Deliver at 34-36 wks

A Peek into an Obstetrician's Life

An Obstetrician's life is
inextricably linked
Pregnancy and Labour are time bound, the days are inked!
She has two lives under her care
Can any speciality match this dare!

"Is it true " people still ask
Bollywood doctor's most difficult task !
'To save the baby or the mother ?
She faces this dilemma with great composure

Her path is clearly defined
Saving the mother is always on her mind
Her greatest joy is the new born's loud cry
An Obstetrician is a gift to humanity no one can deny!

Dr. Sumitra Bachani
Prof. & Senior Specialist [Obgyn]
Faculty Fetal Medicine and Genetic Clinic
VMMC & Safdarjung Hospital, Delhi.

Basques-the European Ethnic Group With the Highest Incidence of Rh Negative Blood Group

Naini Tandon
Consultant, Obgyn
Tandon Clinic, Lucknow
Secretary, Committee for Study of Stillbirths Due to Rh Sensitisation, SBSI
drnainitandon@gmail.com

The Basques are a Southwestern European ethnic group showing specific cultural, demographic, and genetic characteristics. These features and their non Indo-European language Euskara have placed them as an isolated and unique population within Europe.

Basques are indigenous to, and primarily inhabit, an area traditionally known as the Basque Country– a region that is located around the western end of the Pyrenees on the coast of the Bay of Biscay and includes parts of north-central Spain and south-western France.

The Basque Country is one of Europe's oldest and strongest cultures. Furthermore, there is a sizeable diaspora of Basque ancestry present throughout America and Canada. More than 50.000 people in the US claim to have a Basque origin.

Basque Country on Europe Map

The most striking genetic characteristic is their highest frequency of the Rh-D blood group negative allele among the human populations. 34% of the Basques are Rh negative. The HDN incidence in Europeans was 1 in 20 births to Rh-D negative mothers with a mortality around 20–40% before 1968, when Rho(D) immune globulin started to be used as preventive treatment for HDN .Thus the rate of miscarriage and stillborn births among the Basques was extremely high, which may be one of the reasons they remained a small population on a limited amount of land while other populations, especially in Iberia, grew rapidly.

Basques……..

Then

Now

Monthly Report

Asna Ashraf
Consultant, Obgyn
Ujala Medical Center Lucknow
Founder Member and Joint Secretary, SBSI
asnabeg@gmail.com

A webinar of the Rh Iso-immunization Committee of the Stillbirth Society of India was organized on the 29th of January 2022. The welcome address by Prof. Neelam Aggarwal, President of Stillbirth Society of India, was followed by the introduction of the committee by Secretary SBSI, Prof. Tamkin Khan. The Chair of the Committee, Prof. Mandakini Pradhan, and Secretary Dr. Naini Tandon had meticulously planned a clinically relevant programme with learned speakers.

The first talk was on the Prevention of Rh Allo-immunization in pregnancy by Prof. Sukumar Barik, Head, ICARE Institute of Medical Sciences and Research, Haldia, West Bengal. He stressed the importance of Routine Antenatal Anti-D Prophylaxis (RAADP).

The second talk was a comprehensive overview of the Management of Rh Alloimmunization in pregnancy by Prof. Manisha Madhai Beck, Head Fetal medicine Unit, CMC Vellore. It was followed by, a detailed description of Intrauterine Transfusion by Prof. S.C. Saha, PGIMER, Chandigarh.

The highlight of the webinar was the experience sharing on Preventing Stillbirths from Rh Iso-immunization, by the Chairperson Prof. Vatsla Dhadwal, Maternal Fetal Medicine Division Dept. of Obs. Gynae, AIIMS, New Delhi.

The webinar concluded with a very well-summarized take-home message by Prof. Mandakini Pradhan, Chair of the committee and HOD Dept. of Maternal-Fetal Medicine, SGPGIMS, Lucknow.

In case you missed this great academic feast, you can still catch it on our YouTube channel https://youtu.be/xcDmQ3uh2F4

Committee for Study of Stillbirths Due to Rh Sensitisation

Dr. Mandakini Pradhan
Professor and Head, Department of Maternal and Reproductive Health, SGPGIMS, Lucknow.
Chairperson

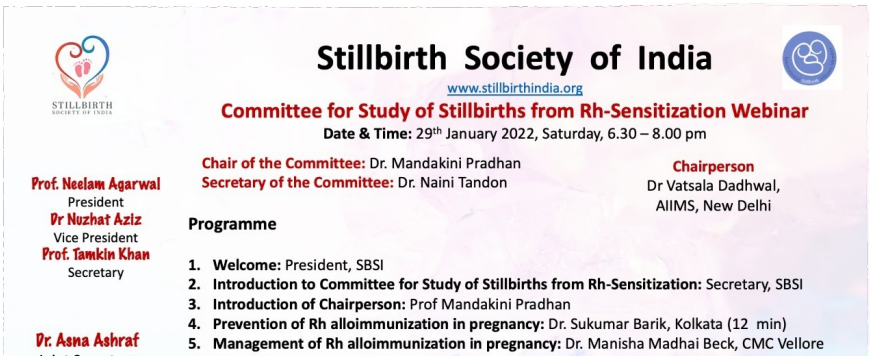
Dr. Naini Tandon
Consultant, Obgyn
Tandon Clinic, Lucknow
Secretary

Dr. SC Saha
Professor , Department of Obstetrics and Gynaecology, PGIMER, Chandigarh
Member

Dr. Manisha Madhai Beck
Professor and Head, Fetal Medicine Unit, Christian Medical College, Vellore, Tamil Nadu
Member

Dr. Shipika Pankaj
Consultant, Obgyn
Neelam Nursing Home, Purnia, Bihar
Member

Dr. Amrita Singh
Consultant, Obgyn
Indira IVF, Lucknow
Member



Stillbirth Society of India

www.stillbirthindia.org

Committee for Study of Stillbirths from Rh-Sensitization Webinar

Date & Time: 29th January 2022, Saturday, 6.30 – 8.00 pm

Chair of the Committee: Dr. Mandakini Pradhan
Secretary of the Committee: Dr. Naini Tandon

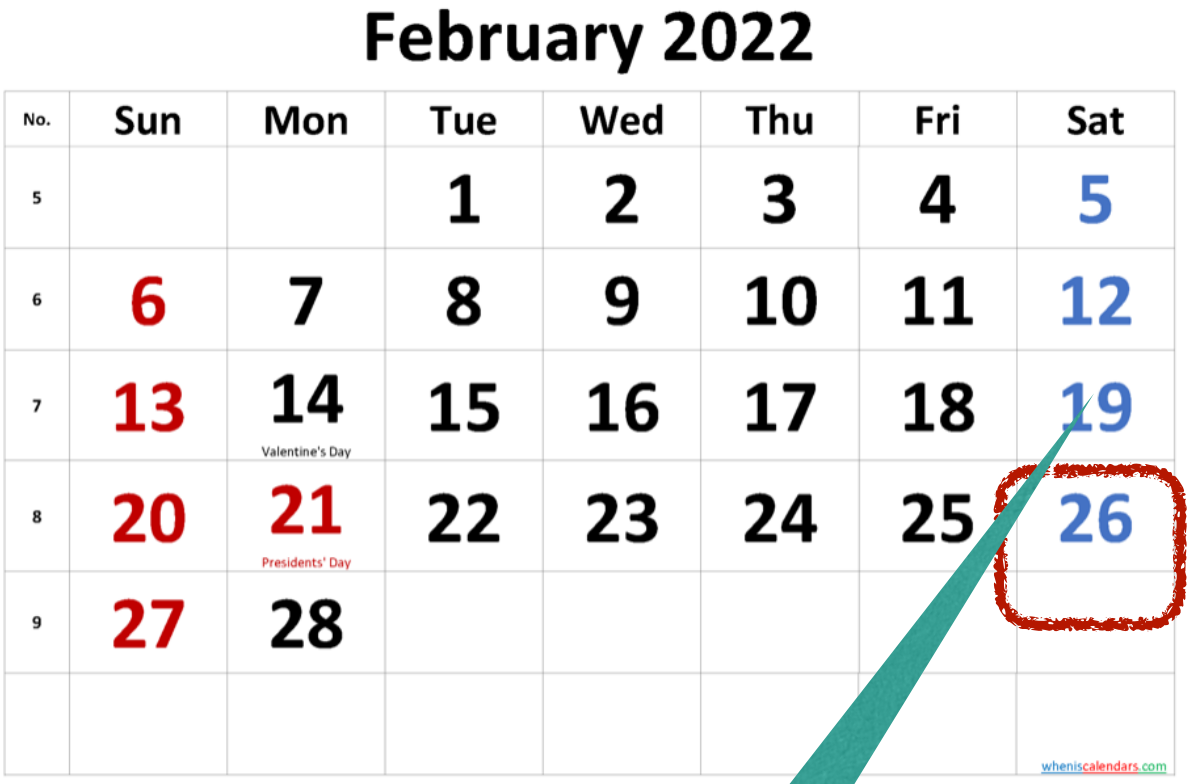
Chairperson
Dr Vatsala Dadhwal,
AIIMS, New Delhi

Prof. Neelam Agarwal
President
Dr Nuzhat Aziz
Vice President
Prof. Tamkin Khan
Secretary

Dr. Asna Ashraf
Joint Secretary
Dr. Ayesha Ahmad
Joint Secretary
Dr. Neetika Garg
Treasurer

Programme

1. **Welcome:** President, SBSI
2. **Introduction to Committee for Study of Stillbirths from Rh-Sensitization:** Secretary, SBSI
3. **Introduction of Chairperson:** Prof Mandakini Pradhan
4. **Prevention of Rh alloimmunization in pregnancy:** Dr. Sukumar Barik, Kolkata (12 min)
5. **Management of Rh alloimmunization in pregnancy:** Dr. Manisha Madhai Beck, CMC Vellore (12 min)
6. **Intrauterine Transfusion (IUT):** Dr. S C Saha, PGI, Chandigarh (12 min)
7. **Take Home Message**: Dr. Mandakini Pradhan (10 minutes)
8. **Concluding remarks and experience sharing by Chairperson**: Dr Vatsala Dadwal (10 min)
9. **Q & A:** Dr. Naini Tandon



February 2022

No.	Sun	Mon	Tue	Wed	Thu	Fri	Sat
5			1	2	3	4	5
6	6	7	8	9	10	11	12
7	13	14 Valentine's Day	15	16	17	18	19
8	20	21 Presidents' Day	22	23	24	25	26
9	27	28					

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Webinar by Maternal and Fetal Infections Committee, SBSI