Rhesus isoimmunization

Presence of RH antibodies in RH −ve maternal circulation

incidence : 45\ 1000 deliveries

10\1000 deliveries

Pathophysiology

RH : presence of D antigen on RBC ….RH positive

15% of white

8% black

2% asian

Etiology of immunization

- transfusion of improperly cross matched blood
- feto-matermal transplacental haemorrhage(TPH)

1. silent
2. abortion
3. ectopic
4. chorionic villus sampling
5. amniocentesis
6. APH
7. external cephalic version
8. postpartum haemorrhage

RHimmune response

when Rh positive cells enter maternal circulation primary immune respose is by IGM antibodies , secondery immune response is by IGG antibodies which capable of crossing the placenta

IMMUNIZATION

depend on :

Amount of blood transfused > 0.25 ml

ABO status of the fetus

ABO compatible : 16%

ABO incompatible : 1-2 %

Pathogenesis of anaemia

when maternal antibodies cross placenta ,attack RH antigen on fetal RBC ,

- non − complement mediated hemolysis occurred
- resulted in fetal anemia which in turn stimulate extra medullary erythropoiesis in fetal liver (hypoproteinaemia , portal hypertension)

- Fetal anemia causes hypoxia , capillary leakage, combination result in hydrops

Prevention

administration of RH immunoglobulin

mechanism of action : it attack fetal RBC that entered maternal circulation

timing of administration :with in 72hrs after delivery

Dose 500iu =100mg

Before giving the antiD … do estimate of fetal blood in maternal circulation by Kleihaur test under 50 lpf

each 5 RBC equivelent = o.25ml

500iu = 4ml = 80cell in HPF

Prevention of hydrops in patient with previous history

1. o+VE gastric acid resistant capsule
2. bone marrow transplant
3. plasmaphoresis.
4. Other methods for prevention :

- during delivery :
- hurry removal of placenta
- avoid unnecessary spillage of blood in peritoneal cavity
- amniocentesis done under USS

Treatment

RH negative none immunized DO:

1. at least 2 blood samples for blood group & RH
2. antibodies titer screening at booking , 18wks ,32 wks
3. anti D to mother with V.B of unknown origin
4. at delivery : indirect coombs test to the mother, kleihaur test , give anti D

Sensitized mother

- **Mildly affected** :
- when titer level less than 1 : 16 or 4iu
- do monthly antibodies titer
- no invasive fetal evaluation
- follow up by USS
- delivery at term
- **moderately or severly affected**

depened on past obstetric history and antibodies titer

- fetal genotyping
- USS we assess:

1. amount of amniotic fluid
1. fetal spleen and liver size placental thickness
2. bowel echogenicity
3. cardiac size

- Doppler USS :

Screening for fetal anemia by assessing blood flow velocity especially in cerebral artery

- fetal hematocrit : most dependable

Two invasive method:

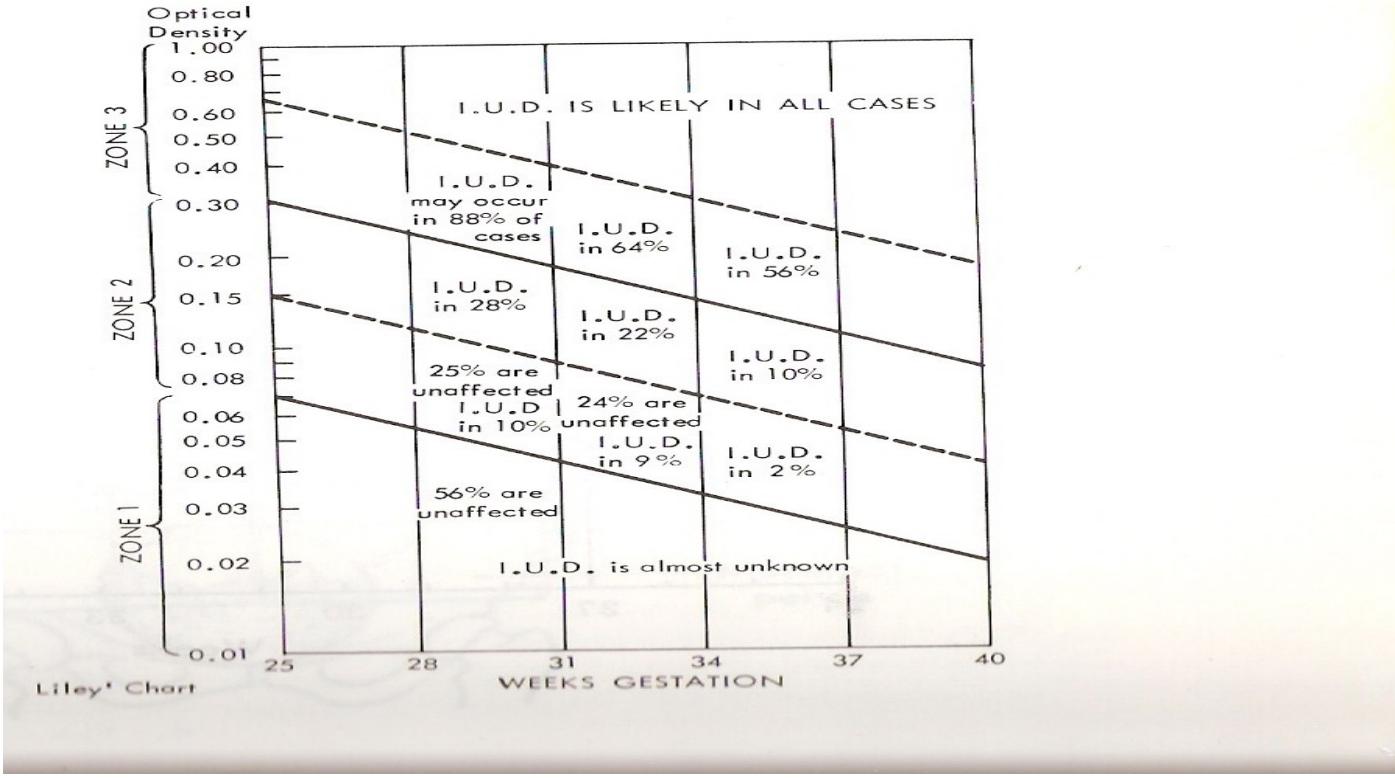
1. direct
2. indirect

- direct Cordocentesis to assess blood grouping &Rh

direct coombs test, PCV , reticulocyte count, bilirubin level

- indirect : by spectrophotometry

By using sample of amniotic fluid obtained by amniocentesisand assess level of bilirubin which reflect relatively fetal hematocrit this level can be plotted against gestational age in what we call it LILEY s chart which divided into

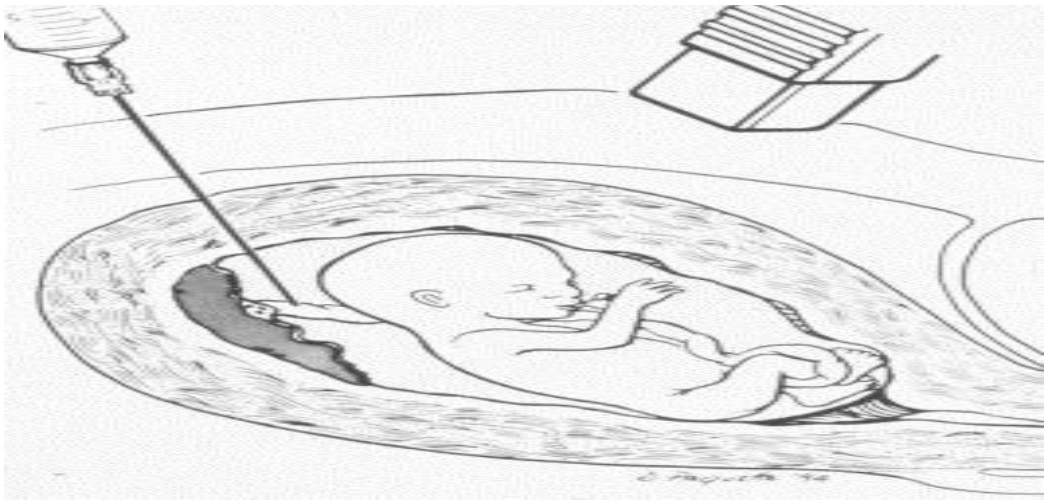


three zones

1. Zone 1 : mildly affected …. repeat after 4 weeks , delivery at term ….rarely affected neonate
2. Zone 2 : moderatly affected ….. repeat after one week , delivery depend on gestational age
3. Zone3 : severly affected fetus ….. need urgent interference by either :

- Intrauterine transfusion or
- Delivery

Cordocentesis



IUT

Two types of intrauterine transfusion:

1. intraperitoneal
2. intravascular

done only when fetus is hydropic or severely anemic

pcv = or <30%

use fresh o −ve blood

Irradiated RBC

pcv = 90%

Under continues fetal heart monitoring