Rhesus isoimmunization

presence of RH antibodies in RH –ve maternal circulation

incidence : 45\ 1000 deliveries

10\1000 deliveries

Pathophysiology

RH : presence of D antigen

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

- resulte in fetal anaemia which in turn stimulate extramedullary erythropoeisis in fetal liver (hypoproteinaemia , portal hypertension)

- fetal anaemia causes hypoxia , capillary leakage, combination result in hydrops

Prevention

administration of RH immunoglobulin

mechanism of action

timing of administration 72hrs

Dose 500iu =100mg

before do estimate of fetal blood in maternal circulation by Kleihaur test under 50 lpf

each 5 RBC equivelent = o.25ml

500iu = 4ml = 80cell in lpf

1. o+VE gastric acid resistant capsule
2. bone marrow transplant
3. plasmaphoresis.

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

Treatment

RH negative non immunized

1. at least 2 blood samples for blood group & RH
2. antibodies titre 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 titre level less than 1 : 16 or 4iu
- do monthly antibodies titre
- no invasive fetal evalution
- follow up by USS
- delivery at term
- ***moderately or severly affected***

depened on past obstetric history and antibodies titre

- fetal genotyping
- USS

1. amount of amniotic fluid
2. fetal spleen and liver size

1. placental thickness
2. bowel echogenicity
3. cardiac size

- Doppler USS :

screening for fetal anemia by assessing blood flow velocity especialy in cerebral artery

- fetal hematocrite

two invasive method :

1. direct
2. indirect

- direct by Cordocentesis to assess blood grouping &Rh

direct coombs test, PCV , reticulocyte count, bilirubin level

- indirect : by spectrophotometry

by using sample of amniotic fluid obtaind by amniocentesis

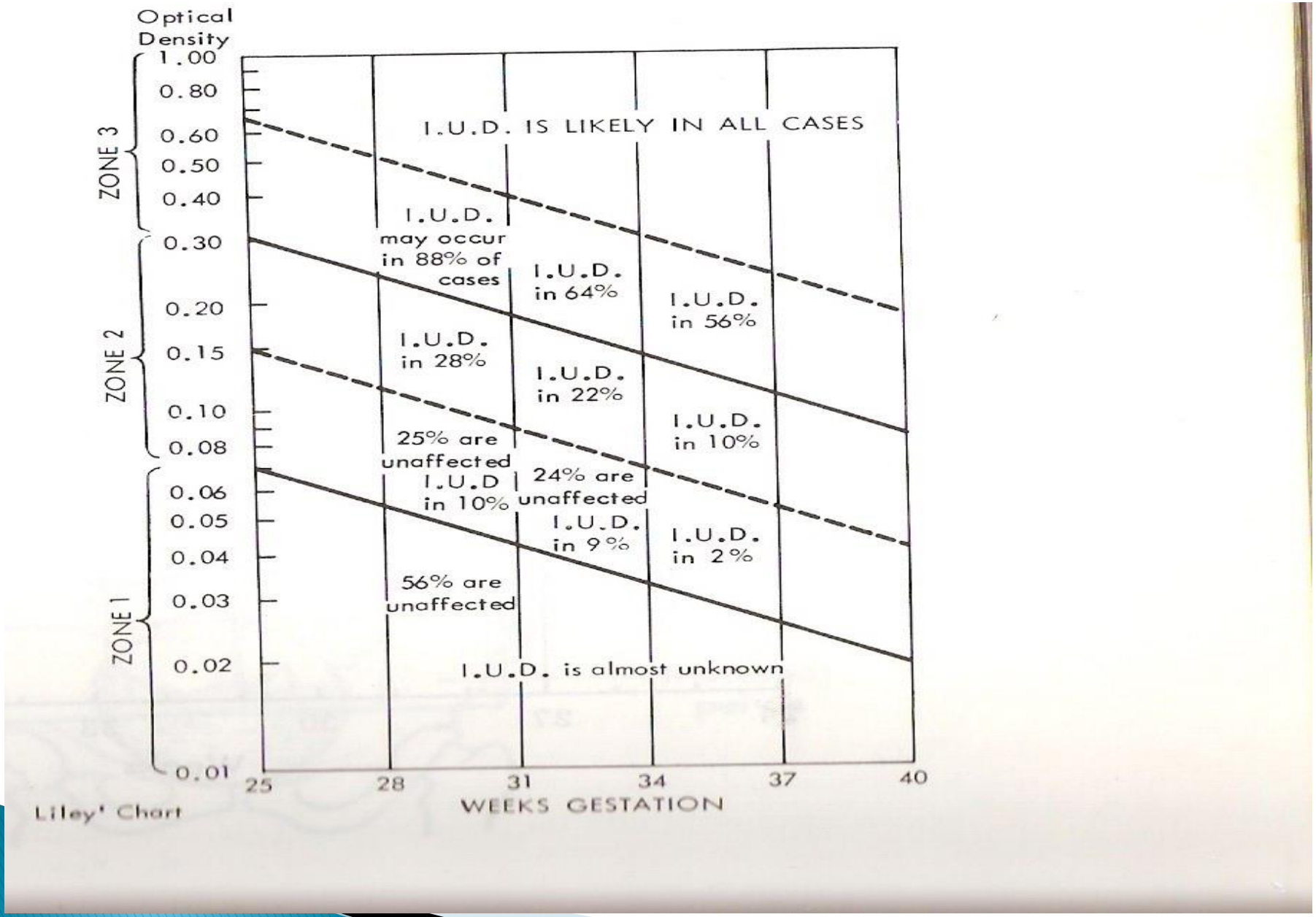
and assess level of bilirubin which reflect relatively fetal hematocrit this level can be plotted against gestational age in what we call it LILEY s chart which divided into

three zones

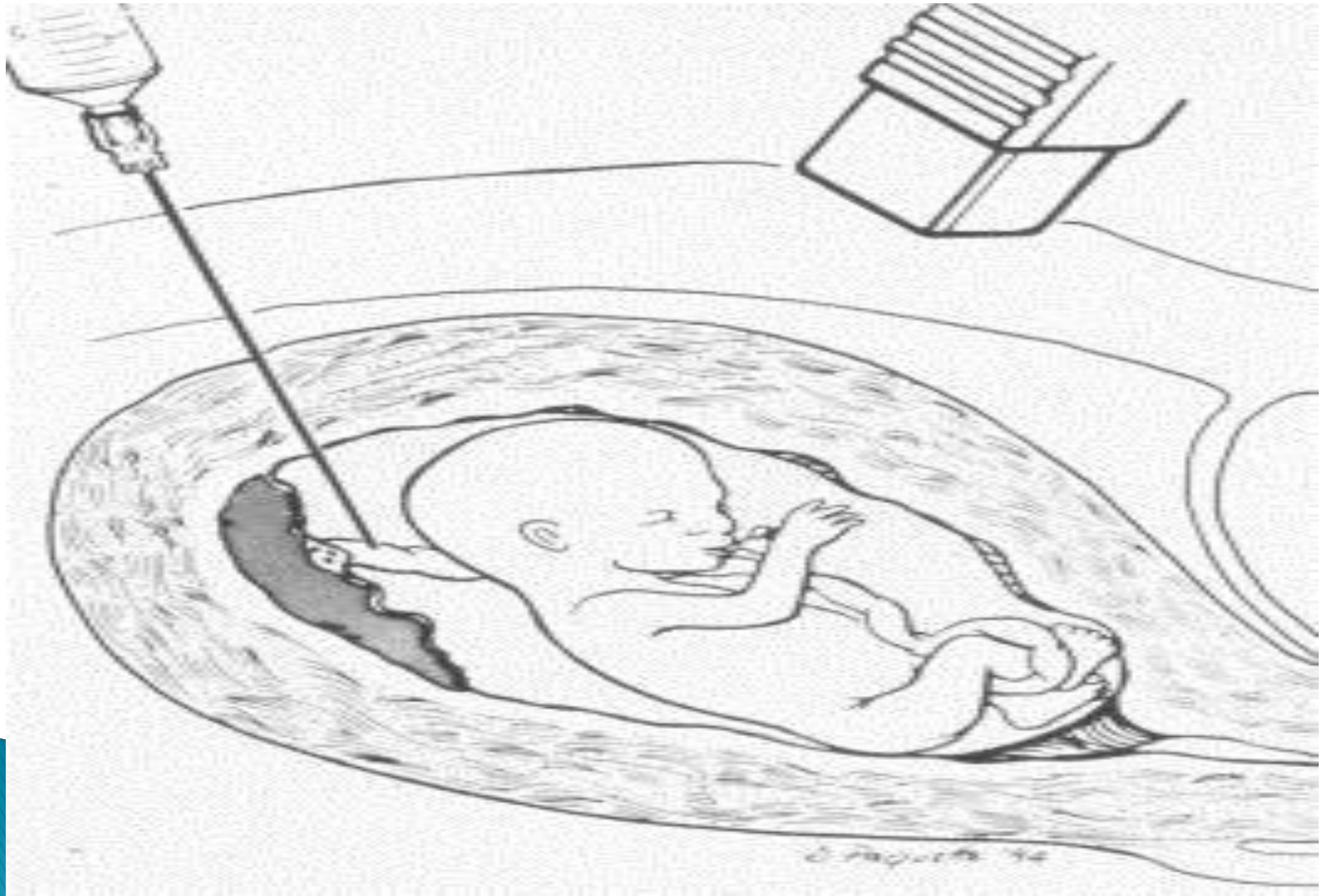
1. Zone 1 : mildly affected …. repeat after 4 weeks , delivery at term ….rarely affected neonate
2. Zone 2 : moderatly affected ….. repeat after one week , delivery depend on gestational age
3. Zone3 : severly affected fetus ….. need urgent interference by either :

- Intrauterine transfusion
- Delivery

Liley' chart


Optical Density
1.00
0.80
0.60
0.50
0.40
0.30
0.20
0.15
0.10
0.08
0.06
0.05
0.04
0.03
0.02
0.01
ZONE 3
ZONE 2
ZONE 1
I.U.D. IS LIKELY IN ALL CASES
I.U.D. may occur in 88% of cases
I.U.D. in 64%
I.U.D. in 56%
I.U.D. in 28%
I.U.D. in 22%
I.U.D. in 10%
25% are unaffected
I.U.D in 10%
24% are unaffected
I.U.D. in 9%
I.U.D. in 2%
56% are unaffected
I.U.D. is almost unknown
25
28
31
34
37
40
WEEKS GESTATION
Liley' Chart

cordocentesis



IUT

two types of intrauterine transfusion :

1. intraperitoneal
2. intravascular

done only when fetus is hydropic or severly aneamic

pcv = or <30%

use fresh o –ve blood

irradiated RBC

pcv = 90%

under continouse fetal heart monitoring