

Amniotic fluid & its abnormalities

AF. or liquor amnii is the protective fluid contained in amniotic sac of pregnant female & surrounded the fetus in the intrauterine life , provided the protective , low resistance space suitable for fetal growth & development.

Development of AF

The AF. can be detected as early as the formation of gestational sac . This is firstly water-like fluid originate from maternal plasma , and passes through fetal membrane by osmotic & hydrostatic forces .

As the placental & fetal vessels develop , the fluid passes through fetal tissues . After 20th – 25th weeks , of pregnancy when the keratinization of skin occurs , the quantity of AF begins to depend on the factors that affect the AF circulation (swallowing & urination) .

In early pregnancy , AF. is only fluid (water) & electrolytes About 12th-14th weeks, the liquid also contains proteins carbohydrates , lipids & phospholipids with urea which are aiding in fetal growth .

The volume of AF. is positively correlated with fetal growth , from 10th – 20th weeks , it increases from 25-400ml & reaches plateau of 800ml at the 34th weeks gestational age .The amount of fluid declines to = 400ml at 42 weeks gestational .

The clinical assessment of AFV. is unreliable by U/S ,these include :

- a. Deepest vertical pocket (DVT) = 2-8cm.
- b. Amniotic fluid index : it's the sum of DVT. in 4 uterine quadrants, which is empty from fetal parts or umbilical

cord . normally the AFI is 10-25cm . AFI < 10 cm decreased , below 5cm is Severe oligohydramnios .

Amniotic fluid functions

1. Reduced the effects of external trauma.
2. Decreases the effects of uterine contraction on fetus .
3. Forms a room in which baby swimming.
4. Maintains fetal body temperature .
5. Acts as nutrients for fetus.
6. Forms a wedge at dilated os before birth.
7. Washes the cervix & vagina by its bacteriostatic function (its PH = 7-7.5).
8. Prevents compression of umbilical cord .

The AF. volume increases steadily throughout pregnancy to a maximum of 400-1200ml at 34-38 weeks & net increase of AF. is only 5-10ml/day in third trimester & after 38 weeks , the volume declines by =125ml per week

Polyhydramnios

Polyhydramnios or hydramnios is an excessive volume of AF. relative to gestational age , which may be acute or chronic. it complicates 1-3.5% of all pregnancies . Its defined as DVT > 8cm or AFI above 95th centile for gestational age. chronic polyhydramnios is more common than acute one.

Risk factors

1. Idiopathic in 90% of cases .
2. Maternal causes : such as DM & Rh- isoimmunization.
3. Placental causes such as chorioangioma or circumvallate placenta .
4. Placental causes such as :
 - Multiple pregnancy (TTTS)

- Gastrointestinal (GI) esophageal atresia , duodenal atresia , annular pancreas & omphalocele.
- CNS lesion : anencephaly ----spina bifida

Hydrocephaly –microcephaly

Encephalocele – hydroneurocephaly

- Skeletal malformation such as osteogenesis imperfect.
- Fetal tumours : sacrococcygeal teratoma.
- Cardiac disease : CHD , fetal arrhythmia .
- Genetic disorders : trisomy 13 ,18.
- Hematological:α–thalassemia,fetomaternal haemorrhage.
- Intrauterine infections : TORch infection & parvo B19 virus.2
- Others : non-immune hydrops fetalis

Management of polyhydramnios : is either

1. Conservative
2. Medical
3. Surgical
4. Both

Depending on etiology , severity , clinical symptoms & GA at diagnosis with any associated abnormalities.

- a. Conservation Mx , by treatment of underlying causes (infection anemia .. etc , in a gradual , mild polyhydramnios
- b. Medical Mx :

Salt restriction

Diuretics

Intra-amniotic vasopressin

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Not
proved
benefit

Indomethacin (NSAID) is suggested as therapeutic modality to reduce AFV because it decrease fetal urinary output .

Indomethacin should be used prior to 30weeks because of risk of premature closure of ductus arteriosus resulting in pulmonary hypertension postnatally .

- c. Surgical managements by therapeutic amniocentesis or complicated in 30-45min & volume aspirated ranging from 200- 4000 ml . Extension compression results in placental separation ,preterm labour& even IUFD

Oligohydramnios

It's a decrease in AFV relative to gestational age or DVP < 2cm & AFV is below 5th centile for GA its incidence = 3.9% , which is either acute or chronic .

Acute oligohydramnios results from premature rupture of fetal membrane &fetal abnormalities .

Causes :

1. Fetal anomalies : such as renal agenesis , multi cystic or poly cystic kidney, posterior Urethral valve .
2. NSAIDS.
3. TTTS.
4. RROM .
5. IUGR & placenta insufficiency .
6. Post term pregnancy (post maturity) .
7. Repetition of cord compression.

DX :

1. Easily palpated fetal parts
2. Small for date fundal height

3. By U/S (DVT & AFI)

Its management is by management of under lying cause accordingly .