

Fetal Measures

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Abstract

An uncommon presentation of Ovarian Hyper stimulation Syndrome is Isolated pleural Effusion. Reporting a case of late onset of ovarian hyper stimulation with Unilateral Pleural Effusion and Respiratory distress as a sole manifestation after Embryo transfer.

Introduction

Majority (80%) of fetal deaths occur in the ante-partum period. The important causes of death are [1] chronic maternal hypoxia (IUGR) [2] Maternal complications, e.g. diabetes, hypertension, infection [3]. Fetal congenital malformations and [5] unexplained cause. There is a progressive decline in maternal deaths all over the world. Currently more interest is focused to evaluate the fetal health. The primary objective of antenatal fetal assessment is to avoid fetal death. As such simultaneously with good maternal care during pregnancy & labor, the fetal health in utero should be supervised with equal vigilance. The fetal evaluation measures are used to the fetus is suspected of being at risk [5,6].

Aims of fetal monitoring:

- To ensure satisfactory growth & wellbeing of the fetus throughout pregnancy
- To screen out the high risk factors that affects the growth of fetus
- To prevent the prenatal morbidity and mortality.

Common indications for fetal monitoring:

- Pregnancy with obstetric complications: IUGR, multiple pregnancies, polyhydramnios or oligohydramnios, rhesus alloimmunisation.
- Pregnancy with medical complications: Diabetes mellitus, hypertension, epilepsy, renal or cardiac diseases, infections (tuberculosis), SLE
- Others: Advanced maternal age (>35yrs), previous still birth or recurrent abortion, previous birth of baby with structural or chromosomal abnormalities.
- Routine antenatal testing.

A. **Clinical evaluation of fetal wellbeing:** At every antenatal visit, the following clinical parameters are taken into account for assessment of satisfactory progress of gestation.

1. **Maternal weight gain:** During second half of pregnancy, the average weight gain is 1 kg a fortnight. Any excess weight

gain may be due to excess fluid retention and could be sign of pre-eclampsia.

2. **Blood pressure:** Initial recording of blood pressure prior to 12 weeks helps to differentiate a pre-existing hypertension from a pregnancy induced hypertension.
 3. **Assessment of the size of the uterus and height of the fundus:** In early weeks, the size of uterus is of great value in confirming the calculated duration of gestation. The height of fundus should be documented at each visit.
 4. **Clinical assessment excess liquor:** Should be recorded, as well as scanty liquor in the last trimester. Evidence scanty liquor may indicate placental insufficiency and the need for undertaking other placental function test.
 5. **Documentation of the girth of the abdomen in the last trimester of pregnancy:** This is measured at the lower border of the umbilicus. Normally, the girth increases steadily up to term. If the girth gradually diminishes beyond term or earlier, it arouses suspicion of placental insufficiency.
- B. **Biochemical measures (early pregnancy):** Antenatal assessment of fetal wellbeing in early pregnancy is primarily designed to detect fetal congenital abnormalities.
1. **Maternal serum alpha fetoprotein (MSAFP):**
 - AFP is an oncofetal protein, produced by the yolk sac & fetal liver.
 - Highest levels of AFP in fetal serum & amniotic fluid are reached around 13 weeks & thereafter it decreases.
 - MSAFP level is elevated in a number of conditions: wrong gestational age, neural tube defects (NTDS), IUFD, renal anomalies etc. low levels are found in trisomies (Down's syndrome).
 - Test is done between 15-20 weeks. Elevated MSAFP detects 85% of all neural tube defects.
 - Nurse will use a small needle to withdraw blood from a vein, & a laboratory specialist will analyze the sample.

2. Triple test:

- It is a combined test which includes MSAFP, HCG & UE3 (unconjugated estriol).
- In an affected pregnancy, level of MSAFP & UE, tend to be low while that of HCG is high.
- It is performed at 15-18 weeks. The result is considered to be screen positive if the risk ratio is 1:250 or greater.

3. Acetyl choline esterase:

- Amniotic fluid AChE level is elevated in most cases of open neural tube defects. It has got better diagnostic value than AFP.
- Inhibin A is a dimeric glycoprotein. It is produced by the corpus luteum & the placenta. Serum level of inhibin A is raised in women carrying a fetus with Down's syndrome.

4. Amniocentesis:

Obtaining a sample of amniotic fluid surrounding the fetus during pregnancy. It is an invasive procedure performed under ultrasonographic guidance. The fetal cells obtained in this procedure are subjected for cytogenetic analysis.

Indications:

Diagnostic (at 11- 20 weeks):

- Chromosomal analysis (Down syndrome), Spina bifida
- Inherited diseases (muscular dystrophy)
- Fetal lung maturation (L/S ratio)

Therapeutic (at any time):

- Reduce maternal stress in polyhydramnios
- Mainly in twin-twin transfusion or if abnormality associated.

5. Precautions:

- Prophylactic administration of 100mg of anti-D immunoglobulin in Rh-negative non immunized mother.

Hazards:

- Maternal complications: infection, hemorrhage, premature rupture of membranes.
- Fetal hazards are fetal loss (0.06-0.5%), trauma, fetomaternal hemorrhage, and oligohydramnios due to leakage of amniotic fluid & may lead to fetal lung hypoplasia.

6. Chorionic villus sampling:

It is performed for prenatal diagnosis of genetic disorders. It is carried out transcervically between 10-12 weeks and transabdominally from 10 weeks to term. Sampling is done to the cyto-trophoblasts. Indications are fetal karyotyping and genetic testing.

Complications:

- Fetal loss (1-2%)
- Vaginal bleeding
- Limb reduction defects are high when CVS was performed at less than 10 weeks of gestation. Anti - D immunoglobulin 50 micro gm IM should be administered following the procedure to a Rh negative women.

7. Cordocentesis:

A 22 gauge spinal needle 13cm in length is inserted through the maternal abdominal and uterine wall under ultrasonic guidance. The needle tip is progressed carefully & it punctures the umbilical vein approximately 1-2cm from the placental insertion. Generally, 0.5 to 2 ml of fetal blood is collected. It is performed under local

anesthesia usually from 18 weeks gestation.

Risks: The invasive procedure may lead to abortion, preterm labor & intrauterine fetal death.

C. Biophysical (early pregnancy): Ultrasonographic examinations of the fetus in early pregnancy can detect fetal anomalies.

- Crown- Rump Length smaller than gestational age is associated with the risk of chromosomal anomalies.
- Nuchal translucency at 10-14 weeks is associated with many chromosomal abnormalities (Trisomy).
- Absence of nasal bone on USG at 10-12 weeks is associated with fetal Down's syndrome.

FETAL MONITORING (late pregnancy):

Objectives:

Prevention of fetal death

Avoidance of unnecessary interventions

Biochemical: mainly done for assessment of pulmonary maturity.

Biophysical tests:

1. Fetal movement counting

Sadovsky technique (4 movements felt in 1 hour)

- For one hour after meal the woman should lie down and concentrate on fetal movement.
- 4 movements should be felt in one hour. If not, she should count for another hour.
- If after 2 hours four movements are not felt, she should have fetal monitoring

Cardiff technique: Done in the morning, Patient should calculate how long it takes to have 10 fetal movements. 10 movements should be appreciated in 12 hours

2. Non stress test:

Done using the cardiotocometry with the patient in left lateral position. Record for 20 minutes. The base line is 120-160 beats/minute.

Reactive:

At least two accelerations from base line of 15 bpm for at least 15 sec within 20 minutes

Non-reactive:

No acceleration after 20 minutes- proceeds for another 20 minutes. If non-reactive in 40 minutes---proceed for contraction stress test or biophysical profile.

Contraction stress test:

Fetal response to induced stress of uterine contraction and relative placental insufficiency Objective is 3 contractions in 10 minutes. It should not be used in patients at risk of pre-term labour or placenta previa.

4. Cardiotocography: after 32 weeks

- Normal Baseline FHR 110-160 bpm
- Moderate bradycardia 100-109 bpm
- Moderate tachycardia 161-180 bpm
- Abnormal bradycardia < 100 bpm
- Abnormal tachycardia > 180 bpm

5. Ultrasound fetal assessment:

- Biometry:
- Biparietal diameter (BPD)
- Abdominal Circumference (AC)
- Femur Length (FL)
- Head Circumference (HC)
- Amniotic fluid
- Placental localization.

6. Fetal biophysical profile:

- NST
- Fetal breathing movements
- Gross body movement
- Fetal muscle tone
- Amniotic fluid

7. Umbilical Doppler Velocity:

Indication:

- IUGR
- PET
- D.M.
- Any high risk pregnancy

Use a free loop of umbilical cord to measure blood flow in it.

Management:

Depends on:

- fetal maturity
- gestational age
- Obstetric history

Management of Doppler Results:

- Reverse flow or absent end diastolic flow--- Immediate delivery
- High resistance index---- repeat in few days or delivery
- Normal flow---- repeat in 2 week if indicate

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