HIGH RISK PREGNANCY SCREENING AND MANAGEMENT IN RURAL AREAS

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Pregnancy is a beautiful journey in a woman’s life.

It is the most powerful creation to have life growing inside of you. There is no bigger gift.
High risk pregnancy is defined as one which is complicated by factor or factors that adversely affects the pregnancy outcome—maternal or perinatal or both.
All pregnancies and deliveries are potentially at risk. However there are certain categories of pregnancies where the mother, the foetus or the neonate in a state of increased Jeopardy.

About 20-30% pregnancies belong to this category.

If we want to improve obstetric results this group must be identified and given extra care.
The risk factor may be preexisting prior to or at the time of first antenatal visit or may develop subsequently in the ongoing pregnancy, labour or puerperium.

Over 50% of all maternal complications and 60% of all previous C-section arise from the high risk group of cases.
Screening:

It is a process of identify apparently healthy people who may be at increased risk of disease or condition.

- May be assessed at the initial antenatal examination preferably in the I trimester of pregnancy or later in the subsequent visits.
- Reassessed near term or during labour
High risk cases (According to WHO during pregnancy):

- Elderly primi > 30 years
- Short statured primi < 140 cm
- Threatened abortion
- APH
- Mal Presentations
- Pre eclampsia & Eclampsia
- Anemia
- Elderly grand multi paras
- Twins & hydramnios
- Previous Still birth, IUFD, Manual removal placenta.
- Prolonged pregnancy
- H/o Pr.C-section & Instrumental delivery
- Medical Disorders.
DURING LABOUR:

- PROM
- Prolonged labour
- Hand, feet or cord prolapse
- Placenta retained for >1 hr
- PPH
- Puerperal fever and sepsis
High risk factors of pregnancy and their management at an ANC clinic

- Complications can occur during pregnancy and affect the health and survival of the mother and the fetus.
- Every pregnant woman must receive at least 4 checkups during pregnancy.
- Registration and 1st check-up within 12 weeks, 14-26 weeks, 28-32 weeks and 36-40 weeks). IFA prophylaxis, TT, Institutional Delivery.
- Proper history should be elicited and complete general physical, systemic and abdominal examinations performed during each ANC visit.
Initial Screening History:

- Age
- Order of pregnancy
- History of PIH, Cardiac Disease, DM, Thyroid disorders, Surgical disorders, Anaemia.
- Obstetric history – Still birth, IUFD, BOH, preterm labour, macrosomic baby, IUGR, PIH, - H/o APH, PPH, MRP, Eclampsia/HELLP
- Complaints – Breathlessness, fatigue, palpitations, puffiness of face, headache, blurring of vision, bleeding PV, leaking PV, Pain abdomen.
Physical Examination:
- Height
- Weight
- BP
- Pallor, edema
- CVS, RS

Abdominal examination
- Uterine height
- Fetal presentation
- FHS

Pelvic examination
Investigations:

- HB %
- Blood grouping and typing
- Blood sugars
- Complete urine examination
- Thyroid test
- HIV, Hbsag, HCV, VDRL
- USG
Post partum:

- PPH
- Retained placenta
- Shock
- Inversion
- Sepsis

High risk new born

- APGAR < 7
- RDS
- Convulsions
Advise to mother:
✓ Rest
✓ Diet
✓ Anaemia Prophylaxis
✓ Preparation for labour
MANAGEMENT:
- High risk cases should be identified and given proper antenatal, intranatal and postnatal care.
- Need specialist care.
- The services of trained community health workers, ANM should be utilized to provide proper care and screening in rural areas.
- Should be referred to specialist referral centers.
- Pre-conception counseling with previous unsuccessful pregnancies.
- Chronic diseases like DM, HTN, Kidney, Thyroid disorders should be properly treated.
- STDs should be treated
- Folic acid Prophylaxis should be given
- Early in pregnancy routine & Special lab investigations should be undertaken.
- Anemia should be corrected with IFA, Iron Sucrose.
- History of IUFD-Special attention
- C-Section
- H/o abortion, cervical incompetence
- Induction of labour after 37 completed weeks
- Close monitoring during labour
- Improvement of economic status, literacy and health awareness.
Each and every one working in health department is committed to reduce the maternal mortality & to realize the reproductive rights of a woman.

Receiving quality antenatal, intranatal, postnatal services is one of the reproductive rights of a woman.
A systematic and a well begun programme with a positive thinking will definitely show road to success to accept this challenge.
Thank You
Hypertensive disorders of pregnancy

- Hypertensive disorders complicate around 10% of pregnancies
- Hypertension is defined as BP $\geq 140/90$ in two consecutive readings at any time of pregnancy
Types of hypertensive disorders in pregnancy

- **Chronic Hypertension**
  - Hypertension that antedates the pregnancy or present before 20 weeks of gestation
  - It can be complicated by pre-eclampsia when there is proteinuria as well.

- **Pregnancy induced hypertension**
  - Hypertension after 20 weeks of pregnancy

- **Pre-eclampsia**
  - May present with any symptoms of headache, blurring of vision, epigastric pain or oliguria and oedema
  - When the blood pressure is $\geq 140/90$ but $< 160/110$ recorded 4-6 hrs apart, associated with proteinuria $> 3$ gm/dl in a 24hrs specimen or with proteinuria trace, 1+ or 2+
Types of hypertensive disorders in pregnancy

- **Severe pre-eclampsia**
  - The blood pressure is $\geq 160/110$ with proteinuria 3+ or 4+

- **Eclampsia**
  - Eclampsia is the occurrence of generalized convulsion(s), usually associated with background of pre-eclampsia during pregnancy, labour or within seven days of delivery
  - However, it can occur even in normotensive women
  - Convulsions with $\geq 140/90$ and proteinuria more than trace
Likely complications of hypertensive disorders of pregnancy

**Maternal**
- HELLP syndrome
- ARDS
- Renal failure
- Pulmonary edema
- DIC

**Fetal**
- IUGR
- IUD
- Fetal distress
- Prematurity
Monitoring of PIH, Severe PE, Eclampsia during ANC

- Focused ANC for rising BP >140/90 and abnormal weight gain tightening of finger rings should be asked at every visit
- Imminent symptoms should be educated to every women that is headache, blurring of vision, epigastric or right upper quadrant pain
- PE profile to include CBC with peripheral smear, coagulation profile, serum uric acid, serum creatinine, blood urea, Hepatic enzymes, Urine: albumin and C/S.
- IUGR to be ruled out through clinical assessment and necessary investigations by 34 weeks.
Principles of Management

• The definitive treatment is delivery but one has to wait until lung maturity and satisfactory gestational age is reached

• The cornerstone would be controlling hypertension, assessing the severity, monitoring the maternal and fetal condition and preventing onset of eclampsia

• Treatment with anti-hypertensive initiated at 90-100mmHg of systolic bp on OPD basis

• Proper rest, high protein diet and anti hypertensive drugs are recommended
Medical Management

• Labetalol 100 mg twice daily is equally effective

• Nifedipine 10-20 mg orally bd/tds (the second line of treatment after alpha methyl dopa).

• In setting of preeclampsia, prophylactic MgSO4 could be given IM.

• 1 gm /day of calcium in pregnancy after 1st trimester reduces risk of Pre-eclampsia by 50%.
Predicting and Preventing Pre-eclampsia

THE SOLUTION

Use risk factors plus biomarkers.

Four useful biomarkers for preterm pre-eclampsia prediction at 11–13+6 weeks’ gestation:

1. Mean arterial pressure (MAP)
2. Serum placental growth factor (PLGF)
3. Uterine artery pulsatility index (UTPI)
4. Serum pregnancy associated plasma protein-A (PAPP-A)

IDEAL PRE-ECLAMPSIA SOLUTION

Universal screening:
All pregnant women should be screened for preterm pre-eclampsia at 11–13+6 weeks’ gestation using a combination of maternal risk factors and biomarkers. The best model combines maternal risk factors + MAP, PLGF & UTPI. PAPP-A can be considered when PLGF & UTPI cannot be measured.

Where resources are limited:
Routine screening for preterm pre-eclampsia by maternal risk factors and MAP should be done in all pregnancies.

Treatment:
Women identified at high risk should receive aspirin prophylaxis at ~150 mg per night commencing at 11–14+6 weeks’ gestation, until 36 weeks gestation.
Anemia during pregnancy and in the postpartum period

- Prevalence of Anemia in pregnant women in India is 58.7%
- Anemia is defined as Hb level < 11g/dl in pregnancy or immediate post partum period
- Anemia is grouped as mild (10-10.9g/dl), moderate (7-9.9 g/dl), severe (< 7 g/dl)
- Iron deficiency anemia is the commonest
Complications due to anemia in pregnancy

Maternal
- Cardiac failure
- Susceptibility to infections
- Preterm labour
- PPH
- Sub-involution
- Failing lactation
- DVT

Fetal
- IUGR
- Anemia of newborn
- Prematurity

Anemia
- Maternal
- Fetal
Diagnosis

- History of weakness, giddiness or breathlessness
- Assess for pallor
- Investigations
  - Hb estimation using haemoglobinometer or by Standard Hb color scale
  - Complete blood count and examination of a thin film for cell morphology, peripheral blood smears for malaria
  - Urine for blood or pus cells and stool for occult blood/ova/cyst
Management

• For prophylaxis: IFA tablet (with 100 mg elemental iron and 0.5 mg folic acid) once daily for 180 days (6 months) starting after the first trimester

• Mild to moderate anemias

• Treated by iron and folic acid tablets (100 mg elemental iron + 0.5 mg folic acid) twice daily and to be continued during postpartum period

• Hb level to be assessed monthly

• Administer parenteral iron preparation if there is noncompliance / intolerance to oral iron

• Cases of moderate and severe anemia may receive anti helminthic drugs (Tab. Mebendazole 100 mg bd for 3 days or Tab. Albendazole 400 mg single dose) especially in hookworm endemic areas during 2nd/3rd trimesters
Indications and dose for parenteral iron therapy

- Intolerance to oral iron
- Poor absorption
- Non compliance
- Moderate to severe anemia in late pregnancy
- For Hb between 7-8 gm%, IM iron therapy in divided doses along with oral folic acid daily if women do not have any obstetric or systemic complication; repeat Hb after 8 weeks
- Delivery of pregnant women with severe anemia should be planned after keeping blood for transfusion ready
Twins/ Multiple pregnancy

Widespread practice of ART has resulted in increased incidence of multiple pregnancies.
Risk of Twins/ Multiple pregnancy

Maternal
- Anemia
- Hyperemesis
- Early onset PET
- Acute Hydramnios
- Atonic PPH
- Increased risk of operative delivery

Fetal
- IUGR
- Congenital anomalies
- Prematurity
- Malpresentations
- PROM
- Cord prolapse
- Placenta previa
- Placental insufficiency
- Twin to twin transfusion
- Stuck or conjoint twin
Diagnosis & Management

• When fundal height > Period of Gestation (POG), an USG to be done to confirm diagnosis (and assess viability, rule out congenital malformations, fetal growth, fetal position)

• Early diagnosis can improve maternal and fetal outcome.

• Requires more frequent visits, increased calories, protein intake, iron supplementation and appropriate rest in lateral position
Placenta Previa

- The implantation of the placenta wholly or partly in the lower segment of the uterus
- Important cause of perinatal mortality mainly due to prematurity
- Incidence is 4-5 per 1000 pregnancies
- Classified depending on the relation to the internal os and if it lies on the anterior or posterior wall
Etiology

- Maternal age
- Multiparity
- Uterine scar
- Multiple pregnancy
- Previous abortion
Diagnosis

• Painless bleeding P/V
• Uterine height corresponds to period of gestation
• soft non-tender uterus and fetal parts palpable
• abnormal presentation, presenting part high floating,
• Placental location to be confirmed during USG.
• Warning bleeding to be taken seriously
Management

- No PV to be done
- Patient to be admitted and to check Hb and blood transfusion if needed
- Routine ANC to continue till 37 weeks
- If patient goes into labour or heavy bleeding then pregnancy to be terminated
Syphilis

Government of India has taken a policy decision for universal screening of pregnant women
Pregnant women at high risk

- Women with current or past history of STI
- Women with more than one sexual partner
- Sex workers
- Injecting drug users
- Signs and symptoms may vary depending on which of the four stages of syphilis the woman presents with
Risk of Syphilis in pregnancy

Fetal
- LBW
- Perinatal deaths
- Congenital syphilis

Maternal
- Still birth
- Spontaneous abortions
- Comorbid conditions like HIV
Diagnosis

• All pregnant women should be tested for Syphilis in the first ANC visit itself using Point of Care (POC) test

• If facility has testing for rapid plasma reagin (RPR) available then testing using RPR may be done

• Those with high risk of syphilis or with history of adverse outcome in previous pregnancy to be screened again in the third trimester

• Testing of spouse in syphilis positive woman is important
Treatment of maternal syphilis

Although severe allergy to penicillin is rare, the provider should rule out history of allergy before administering penicillin. The emergency drugs for managing anaphylaxis should be kept ready prior to administering penicillin.

<table>
<thead>
<tr>
<th>Stage of syphilis</th>
<th>Treatment Recommended</th>
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<tbody>
<tr>
<td>In the early stage (primary and secondary syphilis of &lt;2 years’ duration; RPR titer&lt; 1:8 approximately),</td>
<td>A single intramuscular injection of 2.4 million IU benzathine benzyl penicillin</td>
</tr>
<tr>
<td>In the late stage (tertiary &gt; 2 years or unknown duration, RPR titer&gt;1:8 approximately)</td>
<td>Total of three intramuscular injections of 2.4 million IU benzathine benzyl penicillin once a week for 3 weeks.</td>
</tr>
</tbody>
</table>

**For Penicillin–allergic women**

<table>
<thead>
<tr>
<th>Early stage syphilis;</th>
<th>Erythromycin, 500mg orally 4 times daily for 15 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late stage syphilis</td>
<td>Erythromycin, 500mg orally 4 times daily for 30 days</td>
</tr>
</tbody>
</table>

**Or**

| Primary Syphilis                                                                  | Azithromycin, 2g orally as a single dose                                               |
Hypothyroidism

Prevalence of Hypothyroidism in pregnancy in the Indian population is 4.8-12%
Risk of Hypothyroidism in pregnancy

**Maternal**
- Recurrent pregnancy loss
- Miscarriage
- Stillbirth
- Incidence of pre-eclampsia
- Incidence of abruptio placentae

**Fetal**
- IUGR
- Preterm delivery
Screening for hypothyroidism recommended in:

- Residing in area of known moderate to severe iodine insufficiency
- Obesity
- History of prior thyroid dysfunction, goiter
- History of mental retardation in family/previous birth
- History of recurrent miscarriage/still birth/preterm delivery/IUD/Abruption placentae
- History of infertility
Diagnostic criteria in pregnancy

- TSH levels during pregnancy are lower as compared to TSH levels in a non-pregnant state.

- Pregnancy-specific and trimester-specific reference levels for TSH:
  - 1st trimester - 0.1-2.5mIU/l
  - 2nd trimester - 0.2-3mIU/l
  - 3rd trimester - 0.3-3mIU/l.

- In pregnancy, SCH (sub clinical hypothyroidism) is defined as a serum TSH between 2.5 and 10mIU/L with normal FT4 concentration.

- OH (overt hypothyroidism) is defined as serum TSH>2.5-3mIU/l with low FT4 levels.

- TSH>10mIU/l irrespective of FT4 is OH.
Management of Hypothyroidism in pregnancy

Levothyroxine Sodium is the drug of choice to be taken empty stomach in the morning.

<table>
<thead>
<tr>
<th>TSH level</th>
<th>Management</th>
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<tbody>
<tr>
<td>&lt;2.5 in first trimester and &lt;3 in second and third trimester</td>
<td>No further management is required and pregnant woman will continue routine pregnancy care</td>
</tr>
<tr>
<td>Between 2.5/3 to 10</td>
<td>To be started on 25 µg of levothyroxine per day</td>
</tr>
<tr>
<td>&gt;10</td>
<td>To be started on 50 µg of levothyroxine per day</td>
</tr>
</tbody>
</table>

Once treatment started, TSH levels to be repeated after 6 weeks of starting date of treatment.
Gestational Diabetes Mellitus (GDM)

Rates of GDM in India are estimated to be 10-14.3%
**Risk of GDM in Pregnancy**

### Maternal
- Polyhydramnios
- Prolonged labor
- Obstructed labor
- Pre-eclampsia
- C-section
- Uterine atony
- PPH
- Infection

### Fetal
- Spontaneous abortion
- IUD
- Stillbirth
- Congenital malformations
- Birth injuries
- Neonatal hypoglycemia
- IRDS
Protocol for investigation

• Testing for GDM is recommended twice during ANC

• The first testing should be done during first antenatal contact as early as possible in pregnancy

• The second testing should be done during 24-28 weeks of pregnancy if the first test is negative.

• There should be at least 4 weeks gap between the two tests

• The test is to be conducted for all pregnant women even if she comes late in pregnancy for ANC at the time of first contact

• If she presents beyond 28 weeks of pregnancy, only one test is to be done at the first point of contact
Universal testing for GDGDM

Based on DIPSI guidelines

If 2hr PPPG <120 mg/dL, repeat test every 2 weeks in second trimester & every week in third trimester

If 2hr PPPG ≥120mg/dL medical management (Insulin Therapy) to be started as per guidelines.
Management of Pregnant Woman with GDM

1. Pregnant Woman with GDM
2. Medical Nutrition Therapy (MNT)
3. 2 hr PPPG
   - < 120 mg/dl: Continue MNT
   - ≥ 120 mg/dl: Start Insulin Therapy

   - Monitor 2 hr PPPG
     - Up to 28 weeks: Once in 2 weeks
     - After 28 weeks: Once a week

   - Monitor FBG & 2 hr PPPG every 3rd day or more frequently to maintain normal plasma glucose levels

   - Monitor 2 hr PPPG once weekly
Management

- Patient education
- Medical Nutrition therapy
- Glycemic monitoring: SMBG and targets
- Pharmacological therapy
- Fetal monitoring: ultrasound
- Planning on delivery
Pre-conception care & counselling

- Woman with h/o GDM to be counselled about BMI & Plasma glucose estimation before next pregnancy

- Desired Plasma glucose levels:
  - FPG - <100 mg/dl
  - 2 hr PPPG - <140 mg/dl

- Appropriate antihypertensive to be started if needed

- Counselling to consult Gynaecologist as soon as she misses her period
Counselling tips:

- Gestational diabetes mellitus (GDM) can be easily controlled by diet (MNT) and exercise.
- Only in few women in whom blood glucose is not controlled by diet, insulin injections are required.
- Insulin injections are required only during pregnancy. Insulin will be stopped in most of the cases after pregnancy.
- GDM can not be treated with oral tablets as they may harm the fetus.
- If you are injecting insulin over abdomen, it can not reach your baby in any condition. Injecting insulin over abdomen is 100% safe.
- Modification of diet is very easy and will not cost more. Sweets should be avoided at all times during pregnancy.
- If blood glucose is controlled, you and your baby both are safe and healthy.
- If blood glucose is not properly monitored, it may harm to both you and baby.
- If you are taking insulin, always keep glucose, sugar with you.
- Pregnant women with GDM should deliver at health facilities. It will help in management of any complications which can be countered during delivery.
## Recommendations: Treatment

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<tbody>
<tr>
<td>Insufficient evidence on optimal frequency of testing</td>
<td>Monitor glucose daily</td>
<td>Monitor fasting and postprandial glucose daily</td>
<td>Monitor fasting and postprandial glucose daily, preferably 1 hour after eating</td>
<td>Multiple insulin injections daily: monitor fasting, pre-meal, 1-hour postprandial, and bedtime</td>
</tr>
<tr>
<td>Generally recommend testing four times daily (fasting, after each meal)</td>
<td>Plasma glucose goals (mg/dL): Fasting ≤105 1-hour PP ≤155 2-hour PP ≤130</td>
<td>Goals (mg/dL): Fasting &lt;95 1-hour PP &lt;140 2-hour PP &lt;120</td>
<td>Capillary glucose goals (mg/dL): Fasting 90–99 1-hour PP &lt;140 2-hour PP &lt;120–127</td>
<td>All others: monitor fasting and 1-hour postprandial</td>
</tr>
<tr>
<td>Postprandial glucose goals (mg/dL): 1-hour &lt;140 2-hour &lt;120</td>
<td>Whole blood glucose goals (mg/dL): Fasting ≤95 1-hour PP ≤140 2-hour PP ≤120</td>
<td>Limited evidence that postprandial monitoring is superior in patients on insulin</td>
<td>Target as low as possible ensuring patient comfort and safety</td>
<td>Capillary glucose goals (mg/dL): Fasting &lt;95 1-hour &lt;140 2-hour &lt;115</td>
</tr>
</tbody>
</table>

ACOG, American College of Obstetricians and Gynecologists; ADA, American Diabetes Association; CDA, Canadian Diabetes Association; GDM, gestational diabetes mellitus; IDF, International Diabetes Federation; NICE, National Institute for Health and Care Excellence; PP, postprandial.
Medical nutrition therapy

- All pregnant women with GDM should get Medical nutrition therapy (MNT) as soon as diagnosis is made.
- MNT for GDM primarily involves a carbohydrate controlled balanced meal plan which promotes:
  - Optimal nutrition for maternal and fetal health
  - Adequate energy for appropriate gestational weight gain,
  - Achievement and maintenance of normoglycemia
Special Obstetric care in GDM

• In cases diagnosed before 20 weeks of pregnancy, a fetal anatomical survey by USG should be performed at 18-20 weeks

• For all pregnancies with GDM, a fetal growth scan should be performed at 28-30 weeks gestation & repeated at 34-36 weeks gestation

• There should be at least 3 weeks gap between the 2 ultrasounds and it should include fetal biometry and amniotic fluid estimation

• Women with GDM in whom blood glucose level is well controlled & there are no complications, should go for routine antenatal care as per Government of India guidelines

• In women with GDM having uncontrolled blood glucose level or any other complication of pregnancy, the frequency of antenatal visits should be increased to every 2 weeks in second trimester and every week in third
Special Obstetric care in GDM

- Monitor for abnormal fetal growth (macrosomia/growth restriction) and polyhydramnios at each ANC visit.

- Pregnant women with GDM to be diligently monitored for hypertension in pregnancy, proteinuria and other obstetric complications.

- In pregnant women with GDM between 24-34 weeks of gestation and requiring early delivery, antenatal steroids should be given as per Government of India guidelines, i.e., inj. Dexamethasone 6 mg IM 12 hourly for 2 days.

- More vigilant monitoring of blood glucose levels should be done for next 72 hours following injection.

- In case of raised blood glucose levels during this period, adjustment of insulin dose should be made accordingly.
Fetal surveillance in GDM

- Fetal heart should be monitored by auscultation on each antenatal visit.
- Pregnant women should be explained about Daily Fetal Activity Assessment.
- One simple method is to ask her to lie down on her side after a meal and note how long it takes for the foetus to kick 10 times.
- If the foetus does not kick 10 times within 2 hrs, she should immediately consult a healthcare worker and if required should be referred to a higher centre for further evaluation.
Pregnancy with Previous Caesarean sections

- About 15% of pregnancies suffer from major obstetric complications that require emergency care
- Nearly 10% of the total delivery cases may require CS
- In the past 35 years, the rate of cesarean section has steadily increased from 5% to approximately 25%
Risks to mother in subsequent pregnancies

• Impending or Uterine rupture
• Placenta previa or accreta with accompanying hemorrhage
• Bladder discomfort
• Incidental morbidity can occur during pregnancy, labor & in repeat cesarean section
• Risks to fetus include, preterm delivery and low birth weight
Operative complications with repeat CS

- Operative interference
- There are more technical difficulties & increased chance of injury to the surrounding structures during repeat section
- Difficulty in stitching the uterine incision due extreme thinning and post-operative complications are likely to be increased
• **Intrauterine growth retardation (IUGR)**
  - It is referred to birth weight below the 10th percentile for the gestational age caused by fetal, maternal or placental factors.
  - The fetus is healthy but small for gestational age (SGA).
Etiology of IUGR

- Pre-eclampsia
- Long standing DM
- Placenta Previa
- Pre-pregnancy weight of <50 kg
- Nutritional deficiency particularly protein intake
Diagnosis

• Accurate assessment of gestational age is critical in diagnosis of IUGR.

• Clinical assessment of fetal growth is done by maternal weight gain and SFH (Symphysio- fundal height) measurement done by using measuring tape

• After 20 weeks it is weeks of gestation ± 2cms

• IUGR is suspected if the fundal height is less than 3cms below the GA in weeks.

• Maternal weight gain < 500gms per week
Screening for Small-for-Gestational-Age (SGA) Fetus

Minor risk factors
- Maternal age ≥35 years
- IVF singleton pregnancy
- Nulliparity
- BMI <20
- BMI 25–34.9
- Smoker 1–10 cigarettes per day
- Low fruit intake pre-pregnancy
- Previous pre-eclampsia
- Pregnancy interval <8 months
- Pregnancy interval ≥60 months

Major risk factors
- Maternal age >40 years
- Smoker ≥11 cigarettes per day
- Paternal SGA
- Cocaine
- Daily vigorous exercise
- Previous SGA baby
- Previous stillbirth
- Maternal SGA
- Chronic hypertension
- Diabetes with vascular disease
- Renal impairment
- Antiphospholipid syndrome
- Heavy bleeding similar to menses
- PAPP-A <0.4 MoM

Women unsuitable for monitoring of growth by SFH measurement
- e.g. Large fibroids, BMI >35

Booking assessment (first trimester)

3 or more risk factors

Reassess at 20 weeks
- PAPP-A <0.4 MOM (major)
- Fetal echogenic bowel (major)

Uterine artery Doppler at 20–24 weeks

Assessment of fetal size and umbilical artery Doppler in third trimester

One risk factor

Serial assessment of fetal size and umbilical artery Doppler from 26–28 weeks

Reassess during third trimester

Institute serial assessment of fetal size and umbilical artery Doppler if develop:
- Severe pregnancy induced hypertension
- Pre-eclampsia
- Unexplained APH abruption

Abnormal

Normal
Assessment of fetal wellbeing by clinical and USG parameters

- Daily fetal movement count
- Serial SFH and abdominal girth measurement
- NST (Non stress test) and BPP (Biophysical profile) where possible
Serial SFH and abdominal girth measurement

- Patient is made to lie supine.
- Bladder is emptied and dextrorotation corrected.
- Uterus is palpated carefully to identify the fundus.
- Tape is placed on the abdomen with the zero end at the top of the fundus, with blank side facing upwards (to avoid observer bias).
- The tape is gently stretched to extend up to the upper border of the pubic symphysis and the measurement is taken.
The fundal height is measured from the pubic symphysis to the top of the fundus and plotted on a chart. The lowermost line in the chart represent the 10th centile.
Non Stress Test

- Done during the last three to four months of pregnancy
- Normally takes 20-60 minutes
- Evaluates the fetus without causing it any stress
Fetal Biophysical Profile (BPP)

- Consists of NST and ultrasonographically determined amniotic fluid index.

**BIO PHYSICAL SCORING**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Minimal Normal Criteria</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non stress test</td>
<td>Reactive Pattern</td>
<td>2</td>
</tr>
<tr>
<td>Fetal Breathing movement</td>
<td>Lepisode lasting &gt; 30 Sec</td>
<td>2</td>
</tr>
<tr>
<td>Gross body Movement</td>
<td>3 discrete body / Limb movements</td>
<td>2</td>
</tr>
<tr>
<td>Fetal Muscle Tone</td>
<td>1 episode of extension (Limb / trunk) with return of flexion</td>
<td>2</td>
</tr>
<tr>
<td>Amniotic Fluid</td>
<td>1 Pocket Measuring 2cm in 2 perpendicular planes</td>
<td>2</td>
</tr>
</tbody>
</table>

**INTERPRETATION**

**MANAGEMENT**

- No fetal Asphyxia               | At weekly intervals                                         | 8-10  |
- Chronic Asphyxia                | >36 weeks deliver                                           | 6     |
- Chronic Asphyxia                | <30 weeks repeat testing in 4-6 Hrs                        | 4     |
- Certain Asphyxia                | \( \leq 120 \) min persistent score \( \leq 4 \)           | 2     |
Management

• The guidelines of the Royal college of Obstetrics and Gynaecology (RCOG) recommend the management of these IUGR fetuses including both monitoring and delivery methods.

• Women with an SGA fetus between 24+0 and 35+6 weeks of gestation should receive a single course of antenatal corticosteroids, when delivery is being considered.

• Umbilical artery Doppler should be the primary surveillance tool in the SGA fetus, as this has shown to reduce perinatal morbidity and mortality in high-risk population.

• Repeat surveillance of repeat Doppler will depend on the previous Doppler indices.
Prevention of IUGR

- Taking care of female nutrition enrichment
- Delaying of age at first pregnancy
- Treating chronic disease and pregnancy-induced disorders
- Balanced energy protein supplementation
- Intermittent preventive treatment of malaria in pregnancy
- Multiple micronutrient supplementation
Conclusions

• High-risk pregnancy earlier comprised 20% of all pregnancies, which has now increased to 40%

• This has resulted in more preterm deliveries

• High-risk pregnancies are more commonly seen in first-time mothers, beyond the age of 35, and are characterized by an existing ailment in the mother, including hypertension, polycystic ovary syndrome (PCOS), obesity, an overactive or under-active thyroid, anemia and diabetes

• Lifestyle factors such as use of alcohol and tobacco and obesity also play a role in increasing the risk

• Fatal conditions such as pre-eclampsia and eclampsia, marked by sudden increase in blood pressure, can affect kidneys, liver, and brain