



Diagnosis of Pregnancy

(I) THE FIRST TRIMESTER (0-12 WEEKS)

(A) Symptoms:

1. *Amenorrhoea* : sudden cessation of a previously regular menstruation is the most common symptom denoting pregnancy. However, pregnancy may occur during lactational amenorrhoea. On the other hand, bleeding may occur early in pregnancy as in threatened abortion. Slight bleeding may occur also at the expected time of menstruation in the first 12 weeks of pregnancy but never afterwards due to separation of parts of the decidua vera.
2. *Morning sickness*: nausea with or without vomiting commences in the morning. It usually appears about 6 weeks after onset of the last menstrual period and usually disappears 6-12 weeks later.
3. *Frequency of micturition*: due to congestion and pressure on the bladder and disappear after the first trimester to reappear again near the end of pregnancy when the foetal head descends into the maternal pelvis.
4. *Breast symptoms*: as enlargement, sensation of fullness, tingling and tenderness.
5. *Appetite changes and sleepiness*.

(B) Signs:

(I) Breast signs:

1. Increase in size and vascularity.
2. Increase pigmentation of the nipple and primary areola.(8-10wk)
3. Appearance of the secondary areola.(18-20wk)
4. Montgomery's follicles.(6-8wk)
5. Expression of colostrum.(10-12wk)
6. Breast signs are of value only in primigravidae. In multigravidae , it may be due to the previous pregnancies.

(II) Uterine signs:

1. The uterus becomes enlarged, globular and soft.
2. Palmer's sign: uterine contractions felt during bimanual examination.

3. Hegar's sign: during bimanual examination, the two fingers in the anterior fornix can be approximated to fingers of the abdominal hand behind the uterus due to softening of the lower part of the uterus and its emptiness. This sign can be elicited between 6-10 weeks but not after as the growing conception will fill the whole uterine cavity. (this is painful and should not be carried out)

(III) *Cervix* : soft, hypertrophied and violet. (Chadwick's sign)

(IV) *Vagina*: violet, moist, warm with increased acidity.

N.B*uterus is usually felt on bimanual examination at 6-8 weeks, failure to palpate the uterus by 8-10 weeks is abnormal and warrants further investigations.

***At 12 weeks the uterus is palpated at or above symphysis pubis;**

***Failure to palpate the uterus at symphysis pubis by 12 weeks could be due to:**

1-incorrect dating 2-Retroverted gravid uterus 3-Death of conception

*** Uterus at a larger level could be due to:**

1-incorrect date 2-Multiple pregnancy 3-Molar pregnancy

(C) Investigations: *Hormonal Assay *Ultrasound

(I) *Pregnancy tests:*

These depend on presence of human chorionic gonadotrophin (hCG) in maternal serum and urine.

1- Urine pregnancy tests :

i- Agglutination Test: Latex particles, or sheep erythrocyte (tube) coated with anti-hCG.

ii- Agglutination Inhibition Tests

iii- Dip stick

Causes of false positive results:

1. Proteinuria.
2. Haematuria.
3. At time of ovulation (cross reaction with LH).

4. HCG injection for infertility treatment within the previous 30 days.
5. Thyrotoxicosis (high TSH).
6. Premature menopause (high LH & FSH).
7. Early days after delivery or abortion.
8. Trophoblastic diseases.
9. hCG secreting tumours.

Causes of false negative results:

1. Missed abortion.
2. Ectopic pregnancy.
3. Too early pregnancy.
4. Urine stored too long in room temperature.

2- Serum pregnancy tests: Serum HCG is detectable in the serum of 5% of patients 8 days after conception and in more than 98% of patients by day 11.

Currently, 4 main HCG assays are used, (1) radioimmunoassay (RIA), (2) immunoradiometric assay, (3) enzyme-linked immunosorbent assay (ELISA), and (4) fluoroimmunoassay (FIA). The specifics of each type of test are beyond the scope of this article, but characteristics of each are listed as follows:

- Radioimmunoassay
 - Sensitivity: 5 mIU/mL
 - Time to complete: 4 hours
 - Postconception age when first positive: 10-18 days
 - Gestational age when first positive: 3-4 weeks
- Immunoradiometric assay (more sensitive)
 - Sensitivity: 150 mIU/mL
 - Time to complete: 30 minutes
 - Postconception age when first positive: 18-22 days
 - Gestational age when first positive: 4 weeks
- Immunoradiometric assay (less sensitive)
 - Sensitivity: 1500 mIU/mL
 - Time to complete: 2 minutes
 - Postconception age when first positive: 25-28 days
 - Gestational age when first positive: 5 weeks
- Enzyme-linked immunosorbent assay (more sensitive)
 - Sensitivity: 25 mIU/mL
 - Time to complete: 80 minutes
 - Postconception age when first positive: 14-17 days
 - Gestational age when first positive: 3.5 weeks
- Enzyme-linked immunosorbent assay (less sensitive)
 - Sensitivity: less than 50 mIU/mL
 - Time to complete: 5-15 minutes
 - Postconception age when first positive: 18-22 days
 - Gestational age when first positive: 4 weeks

- Fluoroimmunoassay
 - Sensitivity: 1 mIU/mL
 - Time to complete: 2-3 hours
 - Postconception age when first positive: 14-17 days
 - Gestational age when first positive: 3.5 weeks

ELIZA can be used for urine and serum detection of HCG.

N.B Thepregnanc test becomes negative about:

- one week after labour,
- 2 weeks after abortion, and
- 4 weeks after evacuation of vesicular mole.

Uses of pregnancy test:

1. Diagnosis of pregnancy.
2. Diagnosis of foetal death.
3. Diagnosis of ectopic pregnancy.
4. Diagnosis and follow up of gestational trophoblastic diseases.

(II) Ultrasonography:

TVUS is more better than TAUS and usually detects:

- Gestional sac by 4-5 weeks(grow by 1mm/d) -Yolk sac by 4-5 weeks -Embryonic pole by 5-6 weeks(grow by a rate of 1mm/d)

-Fetal hear motion by 6-7 weeks.

N.BGestational sac of 10mm without presence of Yolk sac indicates abnormal pregnancy, also a yalk sac of >7mm without embryonic pole indicates abnormal pregnancy

Gestational sac can be detected after 4-5 weeks of amenorrhoea. Foetal heart pulsation can be detected as early as 7 weeks.

(II) THE SECOND TRIMESTER (13-28 WEEKS)

(A) Symptoms:

1. Amenorrhoea.
2. Morning sickness and urinary symptoms decrease.

3. *Quickening* : The first sensation of the foetal movement by the mother, occurs at 18-20 weeks in primigravida and at 16-18 weeks in multiparas.
4. Abdominal enlargement.

(B) Signs:

1. *Breast signs*: become more manifested.
2. *Skin signs* : Cloasma, linea nigra and striae gravidarum appear.
3. *Uterine signs*:

i-The uterus is felt abdominally.

ii-*Braxton Hick's contractions*: intermittent painless contractions can be felt by abdominal examination.

4-Foetal signs:

i- *Internal ballottement*: can be elicited at 16 weeks by a push to the foetal parts with the two fingers through the anterior fornix.

ii- *External ballottement*: can be elicited at 20 weeks by a push to the foetal parts with one hand abdominally and the other hand receiving the impulse.

iii- *Palpation of foetal parts and movement*: by the obstetrician at 20 weeks.

iv- Foetal heart sound: can be auscultated at 20-24 weeks by the Pinard's stethoscope.

v- Umbilical (funic) souffle: A murmur with the same rate of FHS due to rush of blood in the umbilical arteries. It is occasionally detected when a loop of the cord lies below the stethoscope.

(C) Investigations in doubtful cases.

1. *Pregnancy tests*.
2. *Ultrasonography*.
3. *X-ray*: It shows the foetal skeleton starting from the 16th week of pregnancy. It has been replaced by ultrasonography due to the following hazards:

i- Teratogenic effects particularly before 10 weeks.

ii- Chromosomal changes in the foetal gonads leading to genetic disorders in the following generations.

iii- Subsequent leukaemia in childhood.

(III) THE THIRD TRIMESTER (29-40 WEEKS)

All signs of pregnancy become more evident. Pregnancy tests are positive, sonar and X-ray are diagnostic.

Sure Signs of Pregnancy:

1. Palpation of foetal parts.
2. Palpation of foetal movements.
3. Auscultation of foetal heart sounds.
4. The occasional auscultation of the umbilical (funic) souffle.
5. Detection of foetal skeleton by X-ray.
6. Ultrasonographic detection of foetal parts, movements and /or heart movements.

Differential Diagnosis of Pregnancy:

(A) Early pregnancy:

(I) Causes of amenorrhoea.

(II) Causes of symmetrically enlarged uterus:

- 1- Myoma.
- 2- Adenomyosis.
- 3- Pyometra.
- 4- Haematometra.
- 5- Metropathia haemorrhagica.

(III) Pelvi-abdominal swellings:

- 1- Ovarian swellings.

2- Tubal swellings.

3- Pelvic haematocele.

4- Full bladder.

(B) Late pregnancy:

1- Myomas.

2- Ovarian neoplasm.

3- Ascitis.

4- Pseudocyst.

5- Other causes of pelvi-abdominal mass.

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