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CHAPTER 1

Persistent Vomiting, Hyperemesis Gravidarum

Haresh U Doshi

- Morning sickness is very common in pregnancy occurring in three-fourths of patients. Persistent vomiting occurs in about 5% of patients.
- Hyperemesis gravidarum is a severe condition affecting the general health of the patients and defined as more than 5% weight loss due to vomiting.
- Real hyperemesis gravidarum is rare, but there are many patients who fall between simple morning sickness of pregnancy to hyperemesis gravidarum, i.e. persistent vomiting.
- It is more common in primigravida and there is a tendency to recur in a subsequent pregnancy.
- Positive family history may be there.
- Commonly used medications are Pyridoxine (Vit B6), Doxylamine, Promethazine and Ondansetron.
- Ondansetron is USFDA category B drug and is very effective. Maximum antiemetic dose is 8 mg 8 hourly orally or parenterally.
- Simple nausea and not feeling like eating is sufficient to start treatment rather than waiting for vomiting.
- When not controlled by oral antiemetics, switch over to parenteral treatment early.
- Do not think and convince the patient that it is normal pregnancy ailment. Patients and relatives already know this and come to you only when unbearable.
- Change of atmosphere, i.e. hospitalization or sending her to maternal place sometimes works.
- Psychological and social support is important.
- Nil by mouth for a day or two, I/V fluids, parenteral antiemetics, and antacids (proton pump inhibitors) and multivitamins (MVI in pint) only help such patients.
- Gradual switching over to liquids and then to bland diet is advised after vomiting stops for 24 hours.
- Food with strong odors and flavors should be avoided.
- Explain to patient and relatives that fasting for 1–2 days is never harmful to the fetus. Patients are worried about this wrongly and start eating something even when vomiting is not fully controlled.
- Many patients require to continue antiemetics and antacids till 7 months or even term.
- Hyperemesis gravidarum requires intensive treatment—hospitalization, investigations, parenteral treatment, and monitoring.
- Termination of pregnancy is never indicated in present times.

CHAPTER 2

Persistent Cough, Recurrent URTI

Haresh U Doshi

- Pregnancy is physiologically immunosuppressive condition.
- Due to this, mild infection commonly occurs.
- Cold and cough are common during pregnancy.
- If there is no underlying pathology, even persistent and/or severe cough does not affect the baby.
- Cough can lead to insomnia, fatigue, stress, and sometimes incontinence.

SIMPLE MEASURES

- Adequate rest.
- Plenty of liquids.
- Warm saline gargles.
- Inhalation.
- Well-balanced diet.
- One should stay away from dust, rain, strong perfumes, or cleaning agents.
- Keep away from people suffering from upper respiratory tract injection (URTI).
- Sleep with head elevated by pillows.
- Garlic and onion in diet helps in cold.

MEDICAL TREATMENT

- Lozenges to soothe the throat.
- Antitussive agents—cough syrup.
- Multivitamins supplements containing vitamin C and zinc.
- As most infections are caused by viruses, antibiotics are not indicated. Only when secondary bacterial infection is diagnosed by clinical features or laboratory investigations, antibiotics like azithromycin, amoxicillin, or cephalosporin group are prescribed.
- In present times Covid-19 infection should be kept in mind and if there is persistent cough and/or associated fever RTPCR test should be done and if positive Covid appropriate guidelines should be followed for management.
- Preventive measures of frequent hand washing, masks and social distancing are essential. Covid-19 vaccination is safe during pregnancy and seasonal Flu vaccine is also recommended in pregnancy.

CHAPTER 3

Aches during Pregnancy

Haresh U Doshi

BACKACHE

- Backache is a common problem during pregnancy.
- Fifty percent of women complain of some degree of backache during pregnancy, most commonly in the second half of pregnancy.
- Backache in pregnancy is due to many reasons:
  - Weight increases during pregnancy and spine has to support this weight; so this causes back pain.
  - Posture is affected as enlarging uterus shifts the center of gravity with stretching of abdominal muscles. This puts more strains on the back.
  - In some patients, divarication of recti allows more forward shifting of uterus causing more backache.
  - Pregnant uterus puts pressure on nerves and with pregnancy hormone relaxin causing ligaments to loosen, increases this effect and causes pain.
  - Emotional stress can cause muscle tension and backache.
- Counseling is important.
- Exercise, e.g. walking.
- Regular light exercise strengthens muscles and increases flexibility.

Postural Advices

- Sitting up straight with shoulders back. If needed, she should use folded towel to support the back.
- Sleeping on side (left lateral) with pillow between the knees and behind the back.
- For lifting anything from the floor, she should bend the knees and not the back.
- Proper posture while walking.

Other Advices

- Adequate rest.
- Avoid high heels, avoid tight clothes, and avoid heavy weight lifting.
- Yoga and meditation helps.
- Heat and cold application. Warm bath and massage.
- Local analgesic spray.
- Medications.
- Motivate for postpartum reduction of weight, otherwise backache will continue.
- Backache with lower abdominal pain or cramps points toward threatened preterm labor. Diagnose and treat it adequately.

LEG CRAMPS

- Cramp or muscle spasm is involuntary contraction or tightening of muscle. It is usually sudden and accompanied by sharp pain.
- In pregnancy, these cramps affect the calf, feet or both, more felt at night and during the second or third trimester.

Causes of Leg Cramps in Pregnancy

- Pressure on the nerves and blood vessels exerted by growing uterus.
- Weight gain of normal pregnancy.
- Edema of legs.
- Pregnancy hormone, particularly progesterone, increases the tension in muscles.
- In some patients, magnesium and calcium deficiency cause leg cramps.
- Cramps are more noticeable at night due to fatigue and fluid accumulation.

Prevention

- Patient should drink plenty of fluids to stay hydrated.
- Legs should not be crossed for a long period of time.
- Before going to bed, stretch the leg muscles for few minutes.
- Take warm bath before going to bed to relax the muscles.
- Use proper footwear with firm heel contour.

Treatment

- Regular exercise which includes stretching. Regular massage.
- Sit with legs elevated on support or stool.
- Wear stockings.
- Local heat application by hot water bag, heating pad, or gel pack.
- Cold application by icepacks.
- Analgesics.
- Vitamin and mineral supplements having vitamin B12, calcium, magnesium and carnitine.

"Backache is the price human beings are paying for upright posture."

CHAPTER 4

Pruritus during Pregnancy

Haresh U Doshi

- Up to 40% of pregnant patients suffer from pruritus.
- Mild pruritus is common in pregnancy because of increased blood supply to skin.
- Nonspecific pruritus occurs on abdomen and breasts as skin stretches due to enlargement. Hormonal changes and dry skin also contribute.
- Pruritus specific to pregnancy is due to intrahepatic cholestasis (IHC).

INTRAHEPATIC CHOLESTASIS

- Itching starts in late 2nd and 3rd trimester.
- Itching starts from palms and soles; may become generalized.
- Itching is NOT accompanied by rashes.
- Itching is sudden in onset and moderate to severe degree. Itching can be severe enough to affect routine life and sleep.
- Itching increases in evening. Incidence is greater in winter than summer.
- Itching does not respond to routine antihistaminics.
- Nausea, fatigue, and decreased appetite are other symptoms. Dark urine and clay-colored stool may occur.
- Most important is risk of stillbirth which increases by 3-fold.
- Elective delivery around 36–38 weeks is recommended to avoid fetal distress and stillbirth.
- Intrahepatic cholestasis is thought to be due to placental hormones affecting liver's function in transporting bile.
- Once IHC is suspected, liver function test (LFT) is advised. Serum bile acids more than 10 μmol/L is specific for diagnoses. Alkaline phosphatase is elevated upto 4-fold but this is not helpful for diagnosis as it is elevated in normal pregnancy due to placental production. Total bilirubin levels are also increased but usually the values are less than 5 mg/dL.[1]
- Simple measures for treatment include wearing loose and cotton clothes, applying calamine lotion or moisturizer, avoiding strong perfumes, and cool baths.
- Specific treatment is ursodeoxycholic acid (UDCA) in the dose or 15 mg/kg/day in divided doses. Drug is available as Udiliv, Hepakind 300 mg tablets. There is no side effect except mild diarrhea. It is stopped at delivery.
- Cholestyramine was used in the past. It does not improve perinatal outcome.
- Intrahepatic cholestasis of pregnancy recurs in more than 50% cases in subsequent pregnancy.
- *Pruritic urticarial papules and plaques of pregnancy (PUPPP)*[2] is another condition specific to pregnancy. Rash usually starts from abdomen and spreads to the thighs, buttocks, breasts, and arms. It typically spares umbilicus, palms, soles, and face.
- It is self-limiting condition and remits in 4–6 weeks of delivery. There is no long-term risk to the mother or the baby.
- Symptomatic treatment in the form of antihistaminics and topical steroids is helpful in alleviating the symptoms.
- All routine antiallergic drugs are safe in pregnancy.

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CHAPTER 5

Threatened Abortion and Subchorionic Hemorrhage

Haresh U Doshi

- One in five pregnant patients has spotting or some vaginal bleeding before 20 weeks or pregnancy.
- In second trimester, maternal factors are more responsible for abortion, while in first trimester fetal factors are more responsible.
- In first trimester in more than half of the cases, chromosomal abnormality is responsible. This risk increases as maternal age increases.
- Antenatal profile should be advised right at first visit. This sometimes reveals diabetes or thyroid disease.
- Ultrasonography (USG) is must for diagnosis and prognosis.
- Ultrasonography [transvaginal sonography (TVS)] features of healthy normal pregnancy include well-formed gestational sac, crown-rump length (CRL) matching with gestational sac, normal yolk sac, cardiac activity more than 80 beats per minute in more than 6 weeks gestation and no subchorionic hematoma.

Ultrasonography features suspicious of failing pregnancy:[1]

- Fetal bradycardia (<80/min).
- Mean sac diameter—CRL ≤5 mm.
- Small or irregular gestational sac.
- Poor decidual reaction.
- Large amniotic cavity.
- Large subchorionic hemorrhage.

  Crown-rump length >7 mm with no cardiac activity – missed abortion.

  Mean sac diameter >25 mm with no embryo – anembryonic pregnancy (Blighted ovum).
- Advanced maternal age and past history of abortion carry bad prognosis.
- With mixed features on USG some bad, some good, time is the best answer to solve confusion. Do not pronounce negative prognosis on first USG in such cases. Do repeat TVS after 7–10 days.
- Some couples are more anxious and want answers early. Advise progesterone and serum B human chorionic gonadotropin (hCG). Serum progesterone more than 25 mg/mL and high beta HCG titers are reassuring. Doubling of serum beta HCG after 48 hours (as practiced in suspected ectopic pregnancy) confirms this.

TREATMENT

- Extensive counseling—spend some time from your busy OPD and reassure the couple that there are very high chances of continuation of pregnancy (>95%) if USG features are reassuring.
- Bed rest at least till bleeding stops. This helps psychologically as people know that for any illness bed rest is required.
- Start routine work after bleeding stops, but avoid strenuous work.
- Avoid sexual intercourse.
- Good hygiene.
- Progesterone supplements 200 mg twice a day preferably vaginally.
- Human chorionic gonadotropin injections 5,000 IU I/M every week till 9 weeks.
- Any patient of first trimester bleeding should be watched for abruption, placenta previa, PROM, preterm labor and IUGR when pregnancy is continued.

SUBCHORIONIC HEMORRHAGE

- Intrauterine hematomas in first half of pregnancy can be subchorionic (most common), retro placental, or subamniotic (rare).
- Small (<20% of sac size) and moderate (20–50% of sac size) subchorionic hematomas often regress.

- The echogenicity of subchorionic or retroplacental hematoma depends upon time. If acute or recent it is bright, if subacute and chronic echogenicity decreases (hypoechoic).
- It may be isoechoic to placenta. It is suspected if retroplacental hypoechoic zone is more than 2 cm and if there is bulging or convexity of placenta toward amniotic cavity. Use of color Doppler will clearly differentiate—in hematoma there is no internal blood flow.
- Small subchorionic hemorrhage does not alter the prognosis.
- Sudden small bout of active bleeding, which spontaneously stops afterward does not indicate bad prognosis if USG features are reassuring.
- Frequency of subchorionic hemorrhage has been shown to be high in pregnancies occurring from assisted reproductive techniques rather than from spontaneous or simple infertility treatment.

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CHAPTER 6

Recurrent Pregnancy Loss: Basic Tips

Haresh U Doshi

- It is now defined as two (previously three) or more losses before 20 weeks of pregnancy.
- Incidence of recurrent pregnancy loss (RPL) is around 1%.
- As the number of pregnancy loss increases, chances of live birth rate decreases. After four consecutive losses it is less than 50%.
- The cause is not found or remains unexplained even after complete investigations in more than 50% cases.
- Major etiological groups (i.e. each group responsible for >10% cases) include endocrine causes, immunological causes, and anatomical causes.
- Apart from basic antenatal investigations, extended investigations in a case of RPL include hormonal assay, ultrasonography (USG) pelvis (if indicated 3D, MRI, and hysterolaparoscopy), antiphospholipid antibodies, cervical swab and culture, and karyotyping of parents.
- Karyotyping of products of conception is not recommended by all authorities across the world. If performed, it only helps in counseling the parents and future prognosis. There are problems of paucity of tissue, tissue decomposition and maternal contamination giving wrong results.
- Detailed history and complete examination narrows down the list of investigations.

ENDOCRINE

- Hyperprolactinemia, hypothyroidism, and diabetes are appropriately treated when detected.
- For luteal phase defect (LPD), polycystic ovarian disease (PCOD), and unexplained infertility, progesterone and human chorionic gonadotropin (hCG) are used.
- Natural micronized progesterone 200–800 μg (NMP) in divided doses or dydrogesterone 10–30 mg daily are used.
- NMP has better bioavailability, it is better tolerated and can be given vaginally, orally, or I/M.
- Progesterone should be started as soon as pregnancy test is positive and continued up to 14 weeks.
- PROMISE trial in 2016 concluded that there is no evidence that first-trimester progesterone therapy improves outcomes in women with a history of unexplained recurrent miscarriages.[1]
- However, recent Cochrane review (2018) concluded that for women with unexplained recurrent miscarriages supplementation with progestogene therapy may reduce the rate of miscarriage in subsequent pregnancies.[2]
- For hCG supplementation, the evidence is equivocal (Cochrane January 2013). A well-designed randomized controlled trial (RCT) of adequate power is required to address the issue.[3]
- It is given 5,000 IU I/M or SQ once or twice a week without much evidence. It is indicated more in those patients with history of early loss and/or oligomenorrhea. It is not indicated after 9 weeks.

ANATOMIC

- For septate and subseptate uterus, no treatment is required before single loss. Treatment (hysteroscopic) should always be done after two losses. Treatment is also offered after one loss.
- There is no surgical treatment for unicornuate uterus. Progesterone and prophylactic cervical cerclage are useful.
- For any case of uterine anomaly associated renal anomaly should be ruled out.
- With very preterm babies (26–28 weeks) now managed by modern NICU, the major surgical treatment for any uterine anomaly is decreasing!
- All submucous fibroids and large intramural fibroids (>4 cm) distorting the cavity, should be surgically removed.
- For intrauterine adhesions causing RPL, hysteroscopic adhesiolysis is recommended. Here, care should be taken to prevent readhesions.

- History indicated and USG indicated cerclage has a role in RPL. It is described under cervical cerclage.

IMMUNOLOGICAL

- For antiphospholipid antibody syndrome diagnosis is confirmed as per standard Sydney criteria which requires one clinical evidence and one laboratory manifestation.[4]
- Clinical include one of the following: (1) One or more unexplained deaths of a morphologically normal fetus at or beyond 10th week of gestation, (2) One or more premature births at less than 34 weeks gestation due to eclampsia, Pre-eclampsia (PE) or placental insufficiency, or (3) Three or more consecutive spontaneous abortions at less than 10th week of gestation with anatomic, hormonal, and chromosomal causes ruled out.
- In laboratory criteria medium or high titers of anti-cardiolipin antibodies (ACA > 40 GPL or > 99th percentile) or anti B2-glycoprotein antibodies as above or presence of lupus anticoagulant (LAC) on two or more occasions not less than 12 weeks apart.
- Once diagnosis is confirmed, aspirin and heparin is the standard treatment for antiphospholipid syndrome (APS) causing RPL.
- Aspirin low dose should be started preconceptional. Currently, aspirin is recommended in 150 mg dose rather than 75 mg.
- Heparin [low-molecular weight heparin (LMWH)] is started as soon as pregnancy test is positive.
- Aspirin is continued till 34 weeks.
- Low-molecular weight heparin is replaced by heparin 4 weeks prior to expected date of delivery. Unfractionated heparin (UFH) is stopped as soon as labor starts.
- As compared to UFH low molecular weight heparin has less risk of bleeding, less thrombocytopenia, less osteoporosis, long half-life, increased bioavailability and does not require monitoring (prophylactic dose).
- It is given as inj. Enoxaparin 40–60 mg sc once daily.

OTHER

- For genetic cause there is no treatment. Genetic counseling should be offered. Rarely when parental karyotyping detects Robertsonian translocation use of donor gamete is recommended.
- If parental karyotyping is normal, preimplantation genetic diagnosis (PGD) does not improve the outcome so it is *not* recommended.
- In congenital hereditary thrombophilia, treatment with heparin is *not* recommended.
- TORCH screening is now abandoned from the investigations list in a case of RPL.
- Screening and treatment for bacterial vaginosis, chlamydia and genital TB is recommended only in indicated patients.
- Psychological interventions help a lot, as stress leads to vicious cycle, and there is tendency to self-blame.
- Most important treatment is "Nothing more than tender loving care, nothing less than tender loving care".
- Vitamin B12 and vitamin D supplementation is recommended if deficiency is found.
- Good prognostic indicators in RPL are: (1) Less number of abortions, i.e. two or three, (2) Secondary RPL (one live birth), (3) Normal fertility, (4) Less maternal age, (5) Early pregnancy losses (<8 weeks), and (6) Abnormal fetal karyotyping, if it is done.

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"Caring is as important as curing."

CHAPTER 7

Preterm Labor

Haresh U Doshi

- It occurs in 10–15% of patients in our country.
- Diagnostic criteria for preterm labor (PTL) are contractions of 4 in 20 minutes or 8 in 60 minutes + progressive change in cervix, i.e. dilatation more than 1 cm and effacement 80% or more. However, such definite criteria are not there in recent guidelines.[1]
- There are many causes of preterm labor, still up to 50% of cases there is no identifiable cause, i.e. spontaneous preterm labor.
- It should be noted that up to 75% of patients suspected of having preterm labor eventually deliver at term without any intervention.

PREDICTION AND PREVENTION

- For prevention, patient education of warning signals is important. These are abdominal cramps, feeling of pelvic pressure, low dull backache, increase/change in vaginal discharge, and uterine contractions less than 10 minutes apart even if painless.
- Two important predictive measures are transvaginal sonography (TVS) and biochemical marker fetal fibronectin.
- Transvaginal sonography to assess the cervix for prediction of PTL is well-proved. Patient with cervical length of less than 2.5 cm has high chances of PTL. Funneling of cervix with width more than 8 mm and Y, V, U shapes of cervix suggest increased chances of PTL.
- Biochemical marker fetal fibronectin more than 50 ng/mL in vaginal secretion predicts PTL. Its negative predictive value is more than 99%.[2]
- Treatment of vaginal and cervical infections and asymptomatic bacteriuria should be adequately done.
- Coitus after second trimester of pregnancy should be avoided.
- Prophylactic tocolysis although commonly practiced is not supported by evidence-based medicine.
- Cervical cerclage is recommended in cases of cervical length shortening seen on transvaginal ultrasound. Sonographic assessment is performed between 16 weeks and 24 weeks of gestation. If it is less than 2.5 cm with prior history of spontaneous preterm birth,[2] or if it is less than 2 cm without history of PTL cerclage is advised.
- Progesterone is found useful in recent prospective trials for prevention. It is given as 250 mg 17 alpha hydroxyprogesterone caproate I/M weekly or 200 mg natural progesterone vaginally daily till 36 weeks. It is recommended in patients high risk for preterm labor.[3] FDA has recently withdrawn 17 alpha hydroxyprogesterone caproate from the market for use in preterm labor.
- Beneficial effect of cervical pessary in reducing preterm birth in women with a short cervix is under research.

MANAGEMENT

- Management of preterm labor includes hospitalization, bed rest, sedation to relieve anxiety, improving hydration and drug therapy. Hydration does work, although effect is temporary.
- Basic investigations + electrolytes (for tocolytics) and sonography for gestational age are carried out.
- The drug therapy for preterm labor includes **tocolytics**, **steroids**, and **antibiotics**.

TOCOLYTICS: SHORT-TERM TOCOLYSIS IS OF PROVEN VALUE

- It gives time for steroids to work and shifting the patient to the place having better NICU facility.
- Long-term tocolysis is not supported by evidence-based medicine. Still, it is widely practiced as it gives some symptomatic relief and psychological support.
- Nifedipine is a calcium channel blocker given orally 30 mg followed by 20 mg tid. It has less maternal side