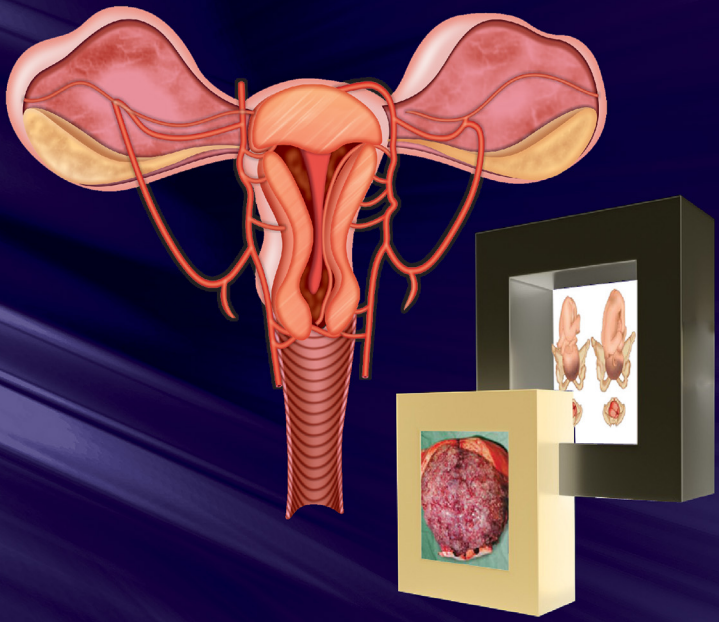
Snapshots in
OBSTETRICS & GYNECOLOGY



JAYPEE

Richa Saxena

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CHAPTER 4

Management of Special Cases in Obstetrics

1. HYPERTENSIVE DISORDERS IN PREGNANCY

1.1. PREECLAMPSIA

INTRODUCTION

According to the working group report on high blood pressure in pregnancy (2000), preeclampsia can be considered as a potentially serious disorder, which is characterized by high blood pressure (> 140/90 mm Hg) and proteinuria (> 300 mg/dL or > 1+ on the dipstick). It usually develops after the 20th week of pregnancy and goes away after the delivery (usually within the 12th postpartum week).

ETIOLOGY

The exact pathophysiology of preeclampsia is not yet understood. The most likely causes for preeclampsia and their underlying mechanisms are as follows:

- Inadequate trophoblastic invasion
- Maternal inflammatory response resulting in vascular endothelial dysfunction
- *Hereditary factors*: The exact genetic defect or preeclampsia gene has not yet been identified
- *Immunological factors*: Production of blocking antibodies to various placental antigenic sites is associated with reduced risk
- Endothelial dysfunction and vasospasm due to increased sensitivity to the action of angiotensin II (vasopressor) and due to the imbalance in production of various prostaglandins.

DIAGNOSIS

Clinical Presentation

- *Increased blood pressure*: Presence of an increased BP (> 140/90 mm Hg) for the first time during pregnancy, after 20 weeks of gestation.

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- *Proteinuria*: Proteinurea is defined as significant if the excretion of proteins exceeds 300 mg per 24 hours or there is persistent presence of the protein (30 mg/dL or 1 + distick) in random urine sample in the absence of any evidence of urinary tract infection
- *Edema*: Edema of hands and face can commonly occur amongst women with preeclampsia. Since edema is a universal finding in pregnancy, it is not considered as a criterion for diagnosing preeclampsia
- *Other symptoms*: Indicators of severe preeclampsia during pregnancy are headache, visual problems, epigastric or right upper quadrant abdominal pain, oliguria (urine volume $\leq$ 500 mL/24 hours), convulsions, etc.
- *Shortness of breath or dyspnea*: This could be reflective of pulmonary edema or acute respiratory distress syndrome
- *Reduced fetal movements*: This is especially observed in association with IUGR and oligohydramnios
- *Weight gain*: Weight gain of more than 2 pounds per week or 6 pounds in a month can be considered as significant.

Abdominal Examination

There may be evidence of placental insufficiency in the form of oligohydramnios and/or IUGR.

Investigations

- *Hematocrit and CBC*: The decrease in blood volume in preeclampsia can lead to a rise in maternal hemoglobin concentration resulting in an increased hematocrit
- *Platelet count*: Platelet count of less than 150–400 $\times 10^9$/liter could be indicative of the HELLP syndrome
- *Kidney function tests*: In severe preeclampsia, raised serum creatinine and uric acid levels are associated with a worsening outcome both for the mother and baby
- *Liver function test*: An AST level of above 75 IU/L can be considered as significant
- *Ophthalmoscopic examination*: The abnormalities include presence of retinal edema, constrictions of the retinal arterioles and alteration of normal ratio of vein: arteriolar diameter.

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DIFFERENTIAL DIAGNOSIS

It is important for the obstetrician to differentiate among preeclampsia, gestational hypertension and chronic hypertension **(Table 4.1)**.

Table 4.1: Characteristic features of various types of hypertensive disorders during pregnancy

	Onset	*Subsidence*	*Blood pressure*	*Proteinuria*
Preeclampsia	Develops after 20th week of pregnancy	Goes away after delivery (usually within 12th postpartum weeks)	> 140/90 mm Hg	Present
Gestational hypertension	Develops after 20th week of pregnancy	Goes away after delivery (usually within 12th postpartum weeks)	> 140/90 mm Hg	Absent
Chronic hypertension	Onset is before pregnancy or before 20th week of pregnancy in absence of gestational trophoblastic disease	The condition does not return to normal within 12 weeks of postpartum period	> 140/90 mm Hg	Absent
Preeclampsia superimposed upon chronic hypertension	Onset is before pregnancy or before the 20th week of pregnancy in absence of gestational trophoblastic disease	The condition does not return to normal within 12 weeks of postpartum period	> 140/90 mm Hg	Onset of proteinuria after 20 weeks of pregnancy

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OBSTETRIC MANAGEMENT

- *Antihypertensive medication*: The aim of treatment must be to maintain diastolic BP between 95 mm Hg and 105 mm Hg. The most commonly used first-line drugs include hydralazine (for severe hypertension), alpha-methyldopa, labetalol and nifedipine. Use of diuretics, angiotensin-converting enzyme (ACE) inhibitors and angiotensin II receptor blockers should be preferably avoided during pregnancy
- *Magnesium sulfate*: Magnesium sulfate should be considered for women with preeclampsia, especially in whom there is concern about risk of eclampsia. A total dose of 14 gm is administered in form of loading (4 gm IV) and maintenance dose (5 gm in each buttock by deep IM injection)
- *Conservative therapy*: Initial therapy for mild-moderate preeclampsia is bed rest until fetal maturation becomes adequate. Prescription of the sedatives or tranquilizers is not required. Low-dose aspirin in the dose of 60 mg daily can be prescribed
- *Maternal monitoring*: In severe cases, blood pressure should be checked at every 15 minutes in the beginning, until the woman has stabilized and then after every 30 minutes in the initial phase of assessment. This can be later increased to 4-hourly intervals and then twice daily. Urine should be carefully monitored for proteinuria twice daily. In the presence of significant proteinuria, a 24-hour estimation of urine proteins may be done. Maternal weight must be measured everyday. Tests, like platelet count, kidney function tests and tests of liver function must be done at the time of admission and then twice weekly
- *Fetal surveillance*: Some of the tests for fetal surveillance include daily fetal movement count; weekly measurement of fundal height and abdominal girth in order to detect IUGR; weekly non-stress test; ultrasound examination for evaluating the period of gestation; BPP and/or serial assessment of liquor after every 2 weeks and Doppler ultrasound at every 3–4 weekly intervals. The frequency of the tests can be increased depending upon the severity of the condition
- *Timing of delivery*: The only way to cure preeclampsia is to deliver the baby. The pregnancy should not be allowed to continue beyond EDD. In cases of severe preeclampsia, when the pregnancy is more than 32 weeks of gestation, delivery is the treatment of choice. Prophylactic steroids should be given to induce fetal lung maturity in case the period of gestation is less than 32 weeks. For pregnancies between 26 and 32 weeks of gestation, the obstetrician needs to balance

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the risk of prolonging the pregnancy, thereby increasing the maternal risk of developing complications related to severe preeclampsia against the risk of delivering a premature fetus which may not even survive

- *Mode of delivery*: Severe preeclampsia *per se* is not an indication for cesarean section. If the cervix is ripe, labor can be induced by using intravenous oxytocin and ARM. In case of presence of unfavorable cervix or other complications (e.g. breech presentation, fetal distress, etc.), a cesarean section needs to be done
- *Management during labor*: Monitoring of vitals especially maternal pulse and blood pressure at hourly intervals is required. Urine protein levels using a dipstick must be monitored at every 6-hourly intervals
- *Management in the postpartum period*: Antihypertensive drugs should be given if the BP exceeds 150 mm Hg systolic or 100 mm Hg diastolic in the first 4 days of the puerperium.

COMPLICATIONS

Some of the maternal and fetal complications related to preeclampsia are enumerated in **Table 4.2**.

Table 4.2: Complications related to preeclampsia

Maternal	*Fetal*
HELLP syndrome	Oligohydramnios
Abruption placenta	Intrauterine death
Cerebral hemorrhage	Premature delivery (before 37 weeks of gestation)
Sepsis/shock	Intrauterine growth retardation
Eclampsia (described in a separate fragment)	Risk of recurrence of intrauterine asphyxia and acidosis
Preeclampsia in subsequent pregnancies	Infant death
Impaired renal/liver function	
Pulmonary edema maternal death	

CLINICAL PEARLS

- Management of cases with preeclampsia is important because there is danger of progression to eclampsia, if the blood pressure remains uncontrollably high

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- In case of magnesium sulfate toxicity, 10 mL of 10% calcium gluconate, which serves as an antidote must be slowly administered intravenously
- Umbilical artery Doppler analysis showing absent or reversed end diastolic flow is associated with poor neonatal outcomes and mandates immediate delivery.

1.2. ECLAMPSIA

INTRODUCTION

Eclampsia can be defined as onset of tonic-clonic convulsions in a pregnant patient with preeclampsia, usually occurring in the third trimester of pregnancy, intrapartum period or more than 48 hours postpartum.

ETIOLOGY

Eclampsia is thought to be related to cerebral vasospasm, which can cause ischemia, disruption of the blood brain barrier and cerebral edema.

DIAGNOSIS

Symptoms

- *Premonitory stage*: In this stage there is unconsciousness; twitching of the muscles of face, tongue and limbs; and rolling and fixation of eyeballs
- *Tonic stage*: There is tonic spasm of the body muscles
- *Clonic stage*: There is alternate contraction and relaxation of the skeletal muscles. Twitching starts from the face onto the extremities and soon involves the whole body
- *Coma*: This may be present for a brief period or may persist for a longer time.

Investigations

These are same as that described with preeclampsia.

DIFFERENTIAL DIAGNOSIS

- Epilepsy/hysteria/poisoning
- Meningitis/encephalitis
- Cerebral malaria/thrombosis.

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OBSTETRIC MANAGEMENT

- Immediate care involves maintenance of airway, oxygenation, maintenance of circulation and prevention of trauma or injury to the patient. An IV line must be secured and the patient must be given IV Ringer's lactate or 0.9% normal saline solution. The patient should be shifted to the eclampsia room. Injury to the patient can be prevented by placing her on a railed bed and using a tongue blade to prevent her from biting her tongue
- Monitoring of vitals including pulse, blood pressure, respiratory rate and oxygen saturation needs to be done at every 15 minutes. Parameters, such as knee jerks, fluid intake and urine output need to be monitored at every half hourly intervals
- Treatment of choice for convulsions is the administration of magnesium sulfate
- Once the patient has stabilized, an obstetric examination must be performed and fetal status must be evaluated and plan to deliver the patient as soon as possible must be made
- Continued fetal monitoring is required until the baby is delivered
- Intrapartum management: Strict blood pressure monitoring must be continued throughout labor. Eclampsia *per se* is not an indication for cesarean delivery. In case the cervix is not favorable, labor can be induced using vaginal prostaglandins and oxytocin infusion. Second stage of labor should be cut short
- Following delivery, close monitoring should be continued for a minimum of 24 hours.

COMPLICATIONS

Maternal

- Injuries due to fall from bed, tongue bite, etc.
- *Pulmonary complications*: These include pulmonary edema, pneumonia, adult respiratory distress, embolism, etc.
- Hyperpyrexia
- *Cardiac*: Acute left ventricular failure
- Renal failure
- Hepatic necrosis
- *Cerebral complications*: Cerebral anoxia; cerebral edema; cerebral dysrhythmia; cerebral hemorrhage, neurological deficits, etc.

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- *Visual complications*: These could be due to retinal detachment or occipital lobe ischemia
- *Hematological complications*: These include thrombocytopenia, DIC, etc.
- *Postpartum complications*: These include shock, sepsis and psychosis.

Fetal

These are same as those described in the fragment of preeclampsia.

CLINICAL PEARLS

- In order to prevent the occurrence of eclampsia, women with severe preeclampsia (BP > 160/110 along with proteinuria) should be given magnesium sulfate as a prophylactic measure
- Occurrence of fits in a quick succession, one after the other is known as status eclampticus.

1.3. CHRONIC RENAL DISEASE DURING PREGNANCY

INTRODUCTION

The most commonly encountered renal diseases during pregnancy are asymptomatic bacteriuria and acute pyelonephritis. Asymptomatic bacteriuria, if left untreated, may develop into symptomatic urinary tract infection including acute pyelonephritis in 25–40% cases.

ETIOLOGY

Most commonly involved pathogenic organism is *Escherichia coli* in both asymptomatic bacteriuria and acute pyelonephritis. Risk factors for the development of both the conditions are shortened, dilated urethra; relative urinary stasis and reduced emptying; glycosuria; dilatation of upper renal tract, etc.

DIAGNOSIS

Clinical Presentation

- Malaise, nausea, vomiting, fatigue
- Fever with or without chills and rigors
- Back pain (localized in the upper lumbar area), with or without uterine contractions

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- Fever, dehydration
- Tachycardia, hypotension (in severe cases of pyelonephritis)
- Costovertebral angle tenderness.

Investigations

- *Hemogram*: Heamtocrit including a complete blood count must be done
- *Urine analysis*: There may be presence of red cells, white cell casts, and bacteria on microscopic examination. Diagnosis of asymptomatic bacteriuria is made if upon culturing the urine sample (collected by midstream catch technique), there is a growth of greater than 10^5 colony forming units (CFUs). Urine culture and sensitivity may also be done
- *Tests of renal function*: There may be elevated serum BUN and creatinine levels and an abnormally low creatinine clearance
- *Histological examination*: Histological examination shows infiltration of the renal interstitium and tubules by polymorphonuclear leukocytes in cases of acute pyelonephritis
- *Serum electrolyte levels*: Abnormal serum electrolyte levels may be indicative of renal dysfunction
- *Blood culture*: Blood culture must be obtained when the patient has chills/rigors or temperature elevation.

MANAGEMENT

Asymptomatic bacteriuria: A three-day course of antibiotics is usually useful for treating the episode of asymptomatic bacteriuria. The most commonly used antibiotics are:

- Nitrofurantoin, 100 mg given orally twice daily for 3–7 days
- Trimethoprim-sulfamethoxazole (one single or double strength tablet, orally twice a day for 3 days)
- Amoxycillin (500 mg orally twice a day for 3–7 days)
- Cephalexin (500 mg orally twice a day for 3–7 days).

Acute pyelonephritis: Aggressive treatment is required in order to avoid disease progression and occurrence of complications and comprises of the following steps:

- Admission to the hospital
- Careful monitoring of the patient's vital signs at every 4 hourly
- Maintenance of adequate hydration through administration of IV fluids
- Treatment with intravenous antibiotics (cefazolin in the dosage of 2 gm at every 8 hourly.

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DIFFERENTIAL DIAGNOSIS

- Acute appendicitis/cholecystitis
- Chorioamnionitis/abruption placenta
- Red degeneration of fibroid.

COMPLICATIONS

- Preeclampsia, preterm labor and prematurity
- Miscarriage, intrauterine fetal death (IUD).

CLINICAL PEARLS

- Women with renal disease should be offered low-dose aspirin as prophylaxis against preeclampsia, commencing within the first trimester
- The characteristic renal pathology in preeclampsia is glomerulo-endotheliosis
- Screening for asymptomatic bacteriuria must occur at the time of first prenatal visit
- Acute pyelonephritis is associated with a reduction in glomerular filtration rate, which can be reversed with the treatment of the underlying infection.

2. ANEMIA DURING PREGNANCY

2.1. IRON DEFICIENCY ANEMIA

INTRODUCTION

WHO defines anemia as presence of hemoglobin of less than 11 gm/dL and hematocrit of less than 0.33 gm/dL. Center of Disease Control [CDC, 1990] have defined anemia as hemoglobin levels below 11 gm/dL in the pregnant woman in first and third trimester and less than 10.5 gm/dL in second trimester. Based on the findings of the peripheral smear and the results of various blood indices, anemia can be classified into three types, which have been shown in the **Table 4.3**.

Table 4.3: Classification of anemia based on the blood values

Type	*Lab value*	*Causes*
Macrocytic normochromic anemia	Increased MCV, normal MCHC (MCV > 100 fl; MCHC-34)	Vitamin B_{12} deficiency; folate deficiency

Contd...

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Contd...

Type	*Lab value*	*Causes*
Microcytic hypochromic anemia	Low MCHC; low MCV; (MCV < 80 fl; MCHC < 30)	Thalassemias; iron deficiency anemia; anemia of chronic disease (rare cases)
Normocytic normochromic anemia	Normal MCHC; normal MCV (MCV > 80–99 fl; MCHC-34)	Physiological anemia of pregnancy, anemia due to chronic disease, anemia due to acute hemorrhage; aplastic anemias; hemolytic anemias

ETIOLOGY

Various causes of iron deficiency anemia are listed in **Box 4.1**.

Box 4.1: Causes of iron deficiency anemia

Nutritional causes
Iron deficiency anemia (60%)
Dimorphic anemia both due to deficiency of iron and folic acid

Hemolytic anemia
Hemoglobinopathies

Anemia due to blood loss
Acute: Antepartum hemorrhage, postpartum hemorrhage
Chronic: Hookworm infestation, bleeding piles, malarial infestation.

DIAGNOSIS

Symptoms

With mild anemia, the woman may present with vague complaints of ill health, fatigue and diminished capability to perform hard labor, loss of appetite, digestive upset, breathlessness, palpitation, dyspnea on exertion, easy fatigability, fainting, lightheadedness, tinnitus, exhaustion, nocturnal leg cramps, headache, paresthesias and numbness in the extremities; oral and nasopharyngeal symptoms; pica; hair loss, etc.

General Physical Examination

- *Pallor*: There may be pallor in lower palpebral conjunctiva **(Fig. 4.1)**, pale nails, pale palmar surface of hands, pale tongue **(Fig. 4.2)**, lips, nail beds, etc.

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Figure 4.1: Pallor in lower palpebral conjunctiva



Figure 4.2: Pale tongue



Figure 4.3: Koilonychia



Figure 4.4: Pedal edema

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- *Epithelial changes*: The epithelial tissues of nails, tongue, mouth, hypopharynx and stomach are affected resulting in development of nail changes [thinning, flattening and finally development of concave "spoon-shaped nails" or koilonychias, **(Fig. 4.3)**], glossitis, angular stomatitis and atrophic gastritis, etc.
- *Pedal edema*: In severe anemic cases, there may be pedal edema **(Fig. 4.4)**
- *Abdominal examination*: Splenomegaly may occur with severe, persistent, untreated iron deficiency anemia.

Investigations

- *Hemoglobin and hematocrit*: Hemoglobin is less than 11 gm/dL and hematocrit is less than 0.33 gm/dL
- *Blood cellular indices*: Abnormalities in various blood indices with iron deficiency anemia are described in **Table 4.4**

Table 4.4: Abnormalities in blood indices with iron deficiency anemia

Blood index	*Normal value*	*Value in iron deficiency anemia*
MCH	26.7–33.7 pg/cell (average 30.6 pg/cell)	< 26.7 pg/cell
MCHC	32–36%	< 30 gm%
MCV	83–97 fl (average 90 fl)	< 76 fl
Hemoglobin	12.1–14.1 gm/dL	< 11 gm/dL in 1st and 3rd trimesters and less than 10.5 gm/dL in 2nd trimester
Hematocrit	36.1–44.3%	< 36.1%
Red cell count	3.9–5.0 × 10^6 cells/μL (average 4.42 × 10^6 cells/μL)	< 3.9 × 10^6 cells/μL or normal
Red cell distribution index	31–36%	< 31%

- *Peripheral smear in iron deficiency anemia*: Peripheral smear of blood shows microcytic and hypochromic **(Fig. 4.5)**. There may be anisocytosis (abnormal size of cells) in the form of microcytosis and/or poikilocytosis (abnormal shape of cells) in the form of pencil cells and target cells. There may be presence of ring or pessary cells with central hypochromia
- *Osmotic fragility*: RBC osmotic fragility is slightly reduced
- *Serum iron studies*: Changes in the various serum iron parameters are described in **Table 4.5**

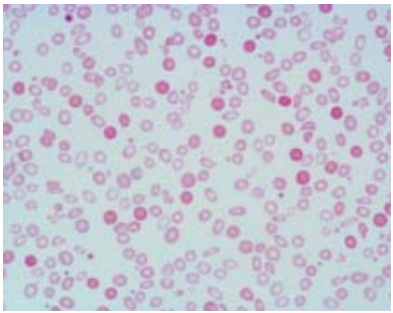


Figure 4.5: Peripheral smear in case of iron deficiency anemia

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Snapshots in OBSTETRICS & GYNECOLOGY

- The idea behind "snapshots" is to present all important topics in obstetrics and gynecology, which are encountered in the clinical practice in form of brief snippets and snapshots
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