Urinary Tract Infection

Urinary tract infections are the most common bacterial infections during pregnancy. Although *asymptomatic bacteriuria* is the most common, symptomatic infection includes *cystitis*, or it may involve the renal calyces, pelvis, and parenchyma—*pyelonephritis*.

Organisms that cause urinary infections are those from the normal perineal flora. Approximately 90 percent of *Escherichia coli*

**Asymptomatic Bacteriuria**

is refers to persistent, actively multiplying bacteria within the urinary tract in asymptomatic women. Bacteriuria is typically present at the first prenatal visit. An initial positive urine culture result prompts treatment, after which, fewer than 1 percent of women develop a urinary tract infection. A clean-voided specimen containing more than 100,000 organisms/mL is diagnostic.

Significance

If asymptomatic bacteriuria is not treated, approximately 25 percent of infected women will develop symptomatic infection during pregnancy. Eradication of bacteriuria with antimicrobial agents prevents most of these.

Treatment

Bacteriuria responds to empirical treatment with any of several antimicrobial regimens

**Single-dose treatment**

Amoxicillin, 3 g Cephalosporin, 2 g Nitrofurantoin, 200 mg

**3-day course**

Amoxicillin, 500 mg three times daily

Ampicillin, 250 mg four times daily

Cephalosporin, 250 mg four times daily

Nitrofurantoin, 100 mg twice daily

**Cystitis and Urethritis**

Lower urinary infection during pregnancy may develop without bacteriuria . Cystitis is characterized by dysuria, urgency, and frequency, but with few associated systemic findings. Pyuria and bacteriuria are usually found. Microscopic hematuria is common, and occasionally there is gross hematuria from hemorrhagic cystitis . Although cystitis is usually uncomplicated, the upper urinary tract may become involved by ascending infection. Almost 40 percent of pregnant women with acute pyelonephritis have preceding symptoms of lower tract infection. Women with cystitis respond readily to any of several regimens. Most of the three-day regimens are usually 90-percent effective ..

Lower urinary tract symptoms with pyuria accompanied by a sterile urine culture may be from urethritis caused by *Chlamydia trachomatis*. Mucopurulent cervicitis usually coex- ists, and azithromycin therapy is effective.

**Acute Pyelonephritis**

Renal infection is the most common serious medical complication of pregnancy .

Clinical findings:

1-Renal infection develops more frequently in the second trimester, and nulliparity and young age are associated risk factors

2- Pyelonephritis is unilateral and right-sided in more than half of cases,

3- there is usually a rather abrupt onset with fever, shaking chills,

4-aching pain in one or both lumbar regions.

5-Anorexia, nausea, and vomiting may worsen dehydration.

6-Tenderness usually can be elicited by percussion in one or both costovertebral angles.

Investigation:

1. the urinary sediment contains many leukocytes, frequently in clumps, and numerous bacteria.
2. Bacteremia is demonstrated in 15 to 20 percent of these women. *E coli* is isolated from urine or blood in 70 to 80 percent of infections, *Klebsiella pneumoniae* in 3 to 5 percent, *Enterobacter* or *Proteus* species in 3 to 5 percent, and gram-positive organisms, including group B *Streptococcus* and *S aureus*, in up to 10 percent of cases.
3. Plasma creatinine is monitored because 20 percent of pregnant women developed renal dysfunction.

Ddx

1-labor,

2-chorioamnionitis,

3-appendicitis,

4-placental abruption, or

5- infarcted leiomyoma.

Complications

1-Varying degrees of respiratory insufficiency from endotoxin-induced alveolar injury are manifest in up to 10 percent of women and may result in frank pulmonary edema and ARDS

2- Uterine activity from endotoxin is common and is related to fever severity

3-Endotoxin-induced *hemolysis* is common, and approximately a third of patients with pyelonephritis develop anemia . With recovery, hemoglobin regeneration is normal because acute infection does not affect erythropoietin production

4- Plasma creatinine is monitored because 20 percent of pregnant women developed renal dysfunction.

**Management**

1-Admission to hospital

2- *Intravenous hydration to ensure adequate urinary output is the cornerstone of treatment*

3- Antimicrobial therapy usually is empirical, and ampicillin plus gentamicin; cefazolin or ceftriaxone

4- High fever should be lowered with a cooling blanket or acetaminophen. is especially important in early pregnancy because of possible teratogenic effects of hyperthermia

5-Obtain urine and blood cultures

6-Evaluate hemogram, serum creatinine, and electrolytes

7-Monitor vital signs frequently

8-Obtain chest radiograph if there is dyspnea or tachypnea

9-Repeat hematology and chemistry studies in 48 hours

10-Change to oral antimicrobials when afebrile

11-Discharge when afebrile 24 hours, consider antimicrobial therapy for 7 to 10 days

12-Repeat urine culture 1 to 2 weeks after antimicrobial therapy completed

**With persistent spiking fever or lack of clinical improvement** by 48 to 72 hours, urinary tract obstruction or another complication or both are considered. Renal sonography is recommended to search for obstruction manifest by abnormal ureteral or pyelocaliceal dilatation

If stones are strongly suspected patient should be send for

1-a renal sonographic examination ,

2-a plain abdominal radiograph (will identify nearly 90 percent.)

3-MR imaging may disclose the cause of persistent infection

Obstruction relief is important, and one method is 1 cystoscopic placement of a double-J ureteral stent

2 percutaneous nephrostomy

3 surgical removal of stones may be required in some women

for recurrence infection : nitrofurantoin, 100 mg orally at bedtime given for the remainder of the pregnancy, reduces bacteriuria recurrence