Urinary tract infection in pregnancy

Dr. Zina Abdullah

A **urinary tract infection (UTI)**, also called bladder infection, is a bacterial inflammation in the urinary tract. Pregnant women are at increased risk for UTIs starting in week 6 through week 24 because of changes in the urinary tract.

- The anatomy of the urinary tract undergoes significant changes during pregnancy, with hormonal and mechanical factors contributing to ureteral dilation, dilation of the renal calyces, and urinary stasis, all of which predispose pregnant patients to urinary tract infections (UTIs).
- Progesterone relaxes smooth muscles, and the gravid uterus compresses the bladder, decreasing bladder capacity. Vesicoureteral reflux, increased residual urine in the bladder, and urinary stasis may be seen. Any of these changes lead to an increased risk of UTI in pregnancy

Definition

- ***UTI*** is an inflammatory response of the urothelium to bacterial invasion that is usually associated with bacteriuria and pyuria.

- ***Bacteriuria*** is the presence of bacteria in the urine.

- ***Pyuria***, the presence of white blood cells (WBCs) in the urine, is generally indicative of infection and/or an inflammatory response of the urothelium to bacteria, stones, an indwelling foreign body, or other conditions that can contribute to pyuria.

- **Bacteriuria without pyuria** is generally indicative of bacterial colonization without overt infection of the urinary tract.

- **Pyuria without bacteriuria**, or sterile pyuria, warrants further evaluation.
  - Eg . Recent UTI treated with antibiotics
  - Steroid therapy
  - Pregnancy
  - GU TB
  - Diabetes

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***

The classifications of UTIs in pregnancy

Include the following:

➢Lower urinary tract infections

- Asymptomatic bacteriuria
- Cystitis

➢Upper urinary tract infection

- Pyelonephritis

Risk factor of UTI in pregnancy

1. Urinary stasis due to hormonal effect
2. Low socioeconomic
3. Past history of UTI, history of recurrent cystitis.
4. Anemia
5. Hygiene status
6. Renal tract abnormalities: duplex system, scarred kidneys, ureteric damage and stones.
7. Diabetes.
8. Bladder emptying problems (e.g. multiple sclerosis).

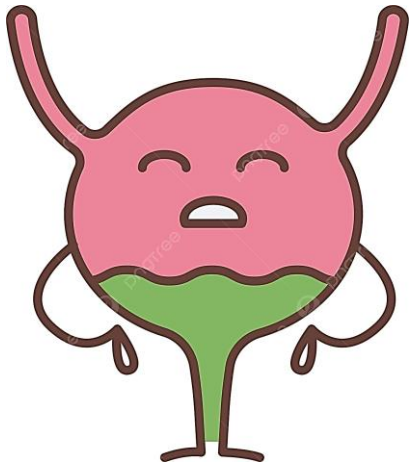
Asymptomatic Bacteriuria

- 8% of pregnant women have asymptomatic bacteriuria, which 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.
- ASB is defined as >100,000 organisms/mL on a clean catch urinalysis obtained from an asymptomatic patient.

Significance

- If asymptomatic bacteriuria is not treated, approximately 25 percent of infected women will develop symptomatic infection during pregnancy with the attendant associations of low birthweight and preterm delivery.
- Eradication of bacteriuria with antimicrobial agents prevents most of these.



Maternal and foetal complications of asymptomatic bacteriuria in pregnancy:

Maternal complications:

- Hypertension
- Pre-eclampsia
- Anemia
- Chorioamnionitis
- Symptomatic acute cystitis,pyelonephritis.

Foetal complications:

1. Intrauterine growth retardation retardation
2. Intrauterine death
3. Low birth weight, Prematurity

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

UTI Prevention

- Drink at least eight glasses of water a day.
- Wipe from front to back when the patient go to the bathroom.
- Empty the bladder shortly before and after sex.
- Don’t use vaginal douche frequently.
- Avoid strong feminine deodorants or soaps that cause irritation.
- Wear cotton underwear.
- Take showers instead of baths.
- Don’t wear pants that are too tight.
- Avoid alcohol, citrus juices, spicy food, and caffeinated drinks, which can irritate the bladder.

HAPPIEST HEALTH

TIPS FOR PREVENTING UTIs DURING PREGNANCY

- Drink plenty of water
- Avoid using public toilets
- Maintain hygiene in private areas
- Urinate regularly
- Wear loose-fitting, breathable cotton underwear
- Avoid using products (like harsh soaps, perfumes or powders) that irritate the genital area
- Ensure a healthy diet with nutrient-rich foods

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 coexists, 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,**

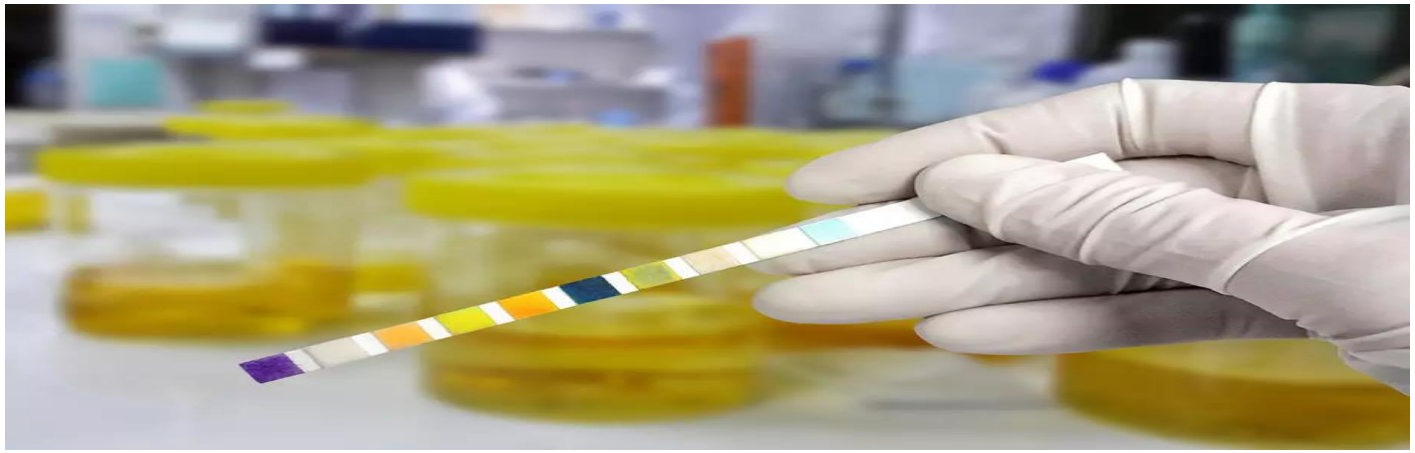
4-aching pain in one or both lumbar regions.

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

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

Investigation:

- ✓the urinary sediment contains many leukocytes, frequently in clumps, and numerous bacteria.
- ✓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.
- ✓Plasma creatinine is monitored because 20 percent of pregnant women developed renal dysfunction.



Differential diagnosis:

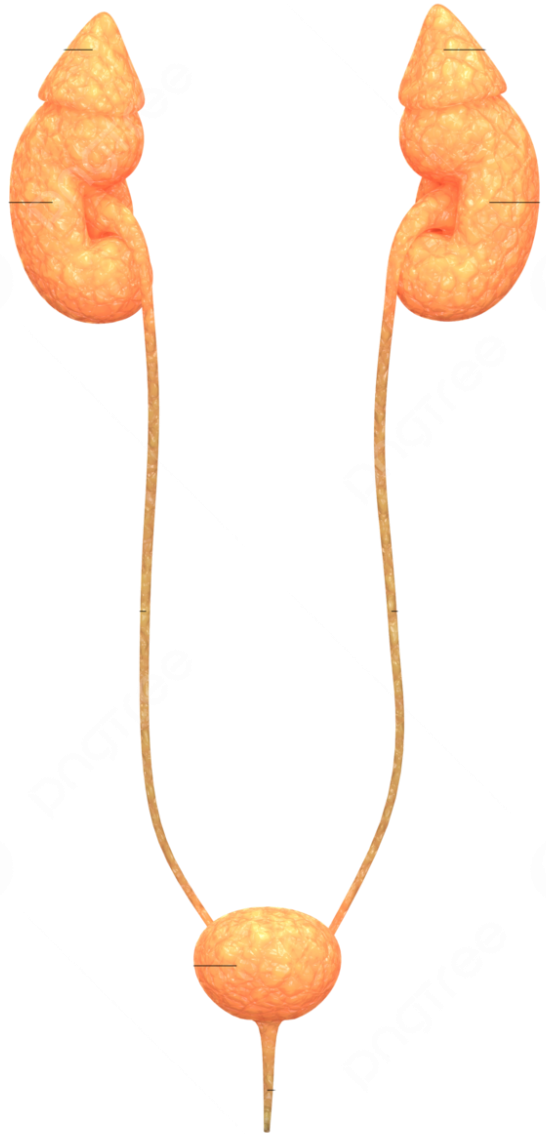
1-labour.

2-chorioamnionitis.

3-Appendicitis.

4-placental abruption, or

5- Infarcted leiomyoma.



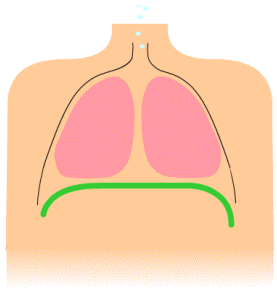
Complications

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; 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.

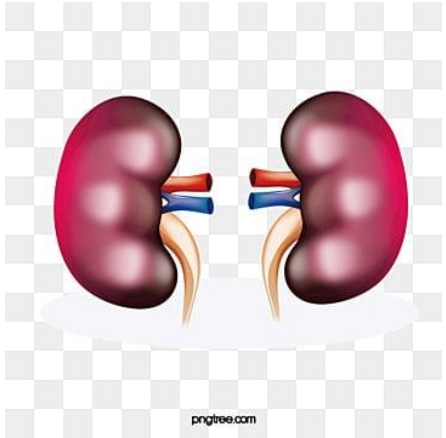
Renal sonography is recommended to search for obstruction manifest by abnormal ureteral or pyelocaliceal dilatation

- If stones are strongly suspected patient should be send for

➢a renal sonographic examination ,

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

➢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

Acute pyelonephritis

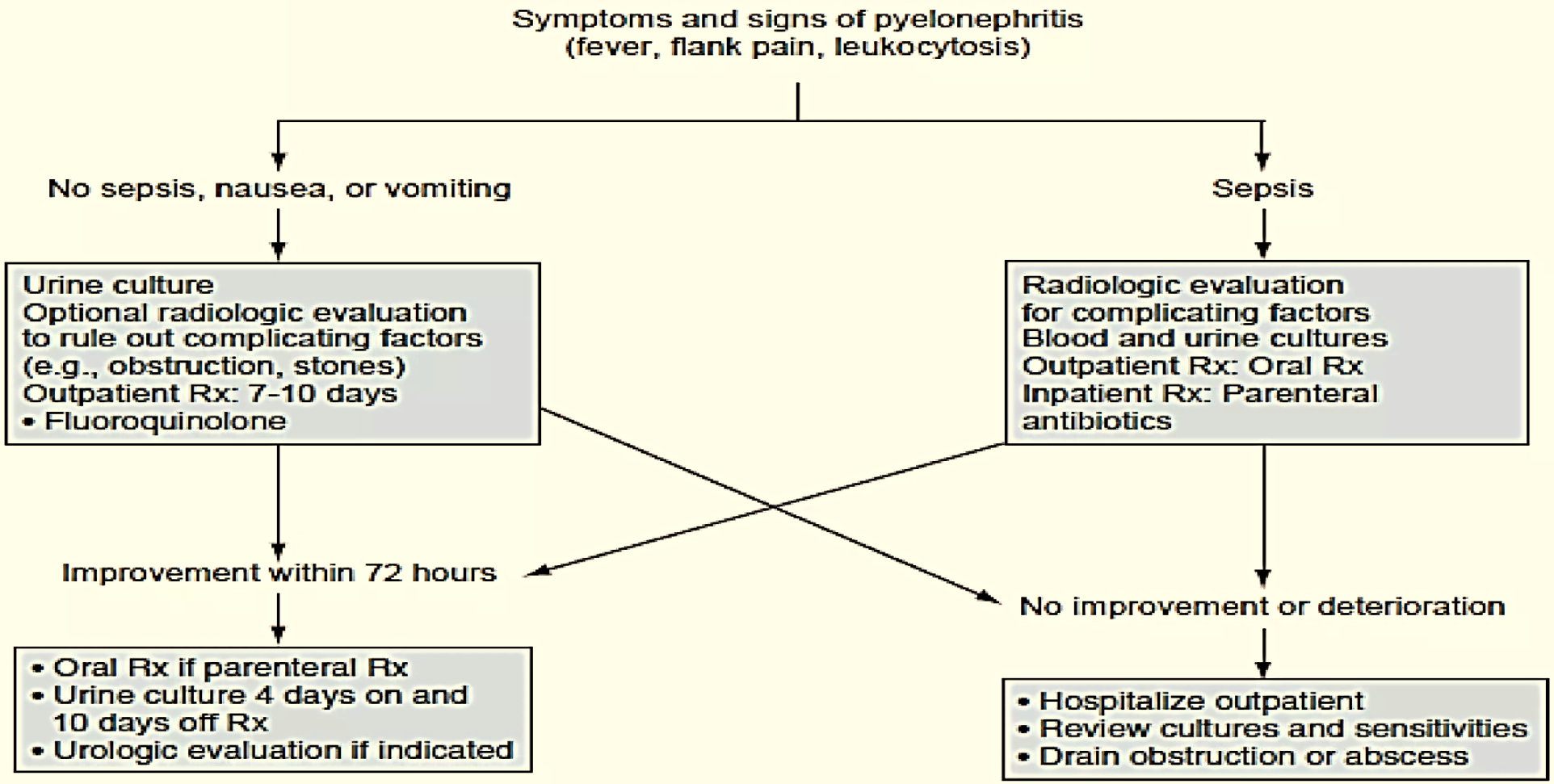


Fig. 55.24. Management of acute pyelonephritis.

Thank you