Urinary tract infections in pregnancy

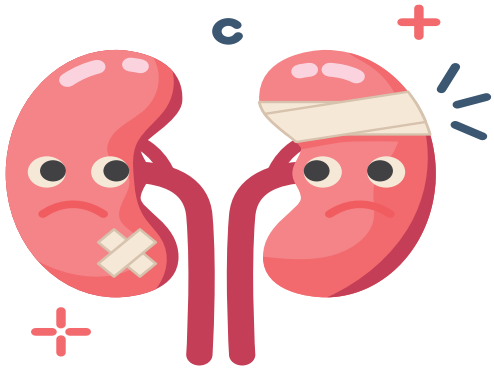
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4th year lecture

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Learning objectives:

1. To define UTI in pregnancy.
2. To identify risk factors.
3. To recognize clinical features.
4. To explain diagnosis and management.



Introduction

Urinary tract infections (UTIs) during pregnancy represent a common yet potentially serious complication, affecting approximately 8% of pregnancies posing risks to both maternal and fetal health

Definition

UTI is defined as the presence of at least 100,000 organisms per milliliter of urine in an asymptomatic patient, or as more than 100 organisms/mL of urine with accompanying pyuria (>5 white blood cells [WBCs]/mL) in a symptomatic patient.

bacteriuria	Is the presence of bacteria in the urine and can be classified as symptomatic or asymptomatic
Pyuria	It involves an elevated number of white blood cells in the urine (presence of pus in urine)
Bacteriuria without pyuria	Is generally indicative of bacterial colonization without overt infection
Pyuria without bacteriuria	Or sterile pyuria, a condition that warrant further evaluation eg; Recent uti treated with antibiotics Steroid therapy, pregnancy Gu TB, diabetes.

Pathophysiology

Pregnant women are at increased risk for UTIs starting in week 6 through week 24 because of changes in the urinary Tract which include:

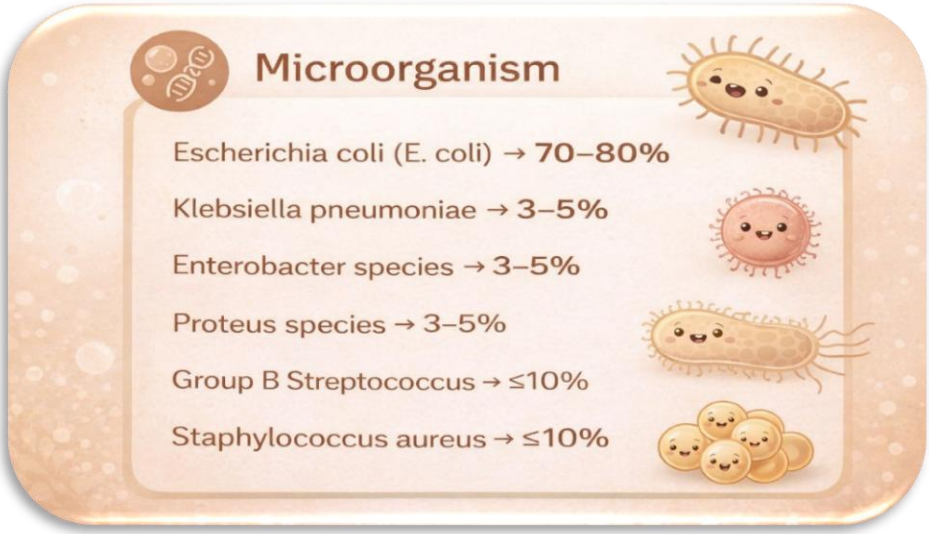
Mechanical: The anatomy of the urinary tract undergoes significant changes during pregnancy,

urinary tract (ureter, pelvis) widening → urine stasis.

Hormonal: 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.

most common causative agents



Classification

Clinical

Asymptomatic 8%

Symptomatic 1-2%

Anatomical

➢Lower urinary tract infections

• Asymptomatic bacteriuria

• Cystitis

➢Upper urinary tract infection

• Pyelonephritis

Risk factors

1. Urinary stasis
2. Low socioeconomics
3. 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).

Types of UTI in Pregnancy

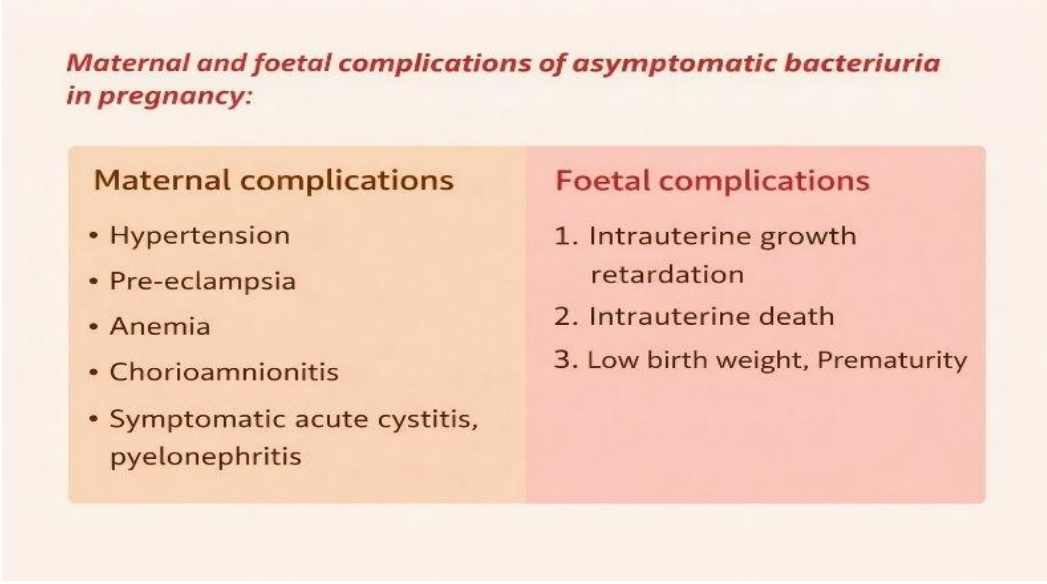
- ### Asymptomatic bacteriuria

ASB is defined as **>100,000 organisms/mL** on a clean catch urinalysis obtained from an **asymptomatic patient.**

Bacteriuria is typically present at the **first prenatal visit**. An initial positive urine culture result prompts treatment, after which, fewer than 1 % of women develop a urinary tract infection.

Significance

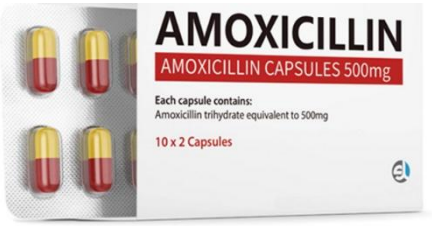
If not treated 25%→ symptomatic infection



Treatment

Clinicians should prescribe a 5–7-day course of targeted antibiotics to treat ASB. There is insufficient evidence to recommend for or against repeat screening after appropriate treatment of an initial episode of ASB.





❖Cystitis and Urethritis

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% of pregnant women with acute pyelonephritis have preceding symptoms of lower tract infection. ➢ Women with cystitis respond readily to any of several regimens.

➢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.

Table 1. Antibiotic Regimens for Treatment of Asymptomatic Bacteriuria and Acute Cystitis

Antimicrobial	Regimen	Considerations
Nitrofurantoin	100 mg orally every 12 h for 5–7 d	Reasonable to offer in the 1st trimester if no appropriate alternatives are available Avoid as treatment for pyelonephritis due to inability to reach therapeutic levels in the kidney
Cephalexin*	250–500 mg orally every 6 h for 5–7 d	
Sulfamethoxazole-trimethoprim	800/160 mg every 12 h for 5–7 d	Reasonable to offer in the 1st trimester if no appropriate alternatives are available In areas with more than 20% resistance to trimethoprim-sulfamethoxazole, avoid if initiating treatment before culture results are available
Fosfomycin	3 g orally once	Avoid as treatment for pyelonephritis due to inability to reach therapeutic levels in the kidney
Amoxicillin*	500 mg orally every 8 h for 5–7 d 875 mg orally every 12 h for 5–7 d	High degree of resistance; avoid if initiating treatment before culture results are available

- ## Acute pyelonephritis

Pyelonephritis is the most common urinary tract complication in pregnant women, occurring in approximately 0.5-2% of all pregnancies.

Renal infection develops more frequently in the **second trimester**, and Nulliparity and young age are associated risk factors

Clinical findings:

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

2- fever 38.0° C or higher, shaking chills.

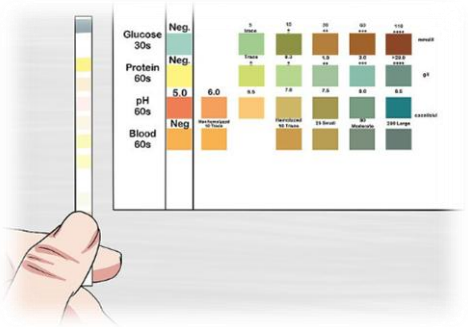
3- aching pain in one or both lumbar regions.

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

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

Investigation

1. Msu [gram stain, bacteria 10^5/ml], pyuria >5 wbc /HPF
2. Urine culture & sensitivity the gold standard
3. Urine dipstick testing
4. FBC for keukocytosis
5. Renal ultrasound





Deferential 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 is manifest in up to 10 percent of women and may result in frank **pulmonary edema and ARDS**

2- **preterm contractions or labour,** 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.**

5- sepsis

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 patients should be sent 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

Recurrent UTI is defined as having two or more UTIs diagnosed during pregnancy

If prophylaxis is initiated, there are two common strategies available: postcoital or continuous prophylaxis for the remainder of the pregnancy.

• for prophylaxis: nitrofurantoin, 100 mg orally at bedtime or cephalexin 250–500 mg orally daily. given for the remainder of the pregnancy.

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.

Best of luck