

OBSTETRICS AND GYNECOLOGY

(13) Urinary changes & infection in pregnancy

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Objectives:

Not given 😞

- Anatomical Changes in Pregnancy:

- ▶ **Kidneys:** ↑ in length, weight, and pelvis size (**physiologic hydronephrosis**); Rt > Lt.
- ▶ **Ureters:** dilated or hydroureter (Rt > Lt) because the ureter is compressed between the pelvic bone and the uterus and the enlarged uterus is tilted to the right side more than the left, urinary stasis caused by the high levels of progesterone during pregnancy and that decreases the contractility of smooth muscles, therefore peristalsis of ureter is decreased.
- ▶ **Mechanism:** hormonal (**progesterone**) or mechanical.
- ▶ **Consequences:** ↑ risk of urinary tract infections.

- Physiologic Changes in Pregnancy:

- ▶ 40-50% ↑ in renal blood flow and glomerular filtration rate (GFR) → creatinine clearance.
- ▶ ↓ Serum level of creatinine, urea, uric acid by 25%
- ▶ The physiologic increase in GFR during pregnancy normally results in low serum creatinine levels, so in a normal pregnant woman creatinine levels should be sub normal if they were high normal then there is an abnormality.
- ▶ Fluid volumes: ↑ extracellular volume (intravascular 50% & interstitial component).
- ▶ Na & Ka levels maintained.
- ▶ Chronic loss of renal HCO₃ → ↑ risk of metabolic acidosis.

- Urinary Excretion of nutrients:

- ▶ Glucosuria: ↑ filtered tubular glucose and ↓ tubular reabsorptive capacity as a consequence there is an ↑ risk of UTI.
- ▶ Proteinuria: abnormal.
- ▶ Aminoaciduria: ↑ risk of UTI.
- ▶ Water-soluble vitamins: folate and B12.

- Urinary Tract Infections in Pregnancy:

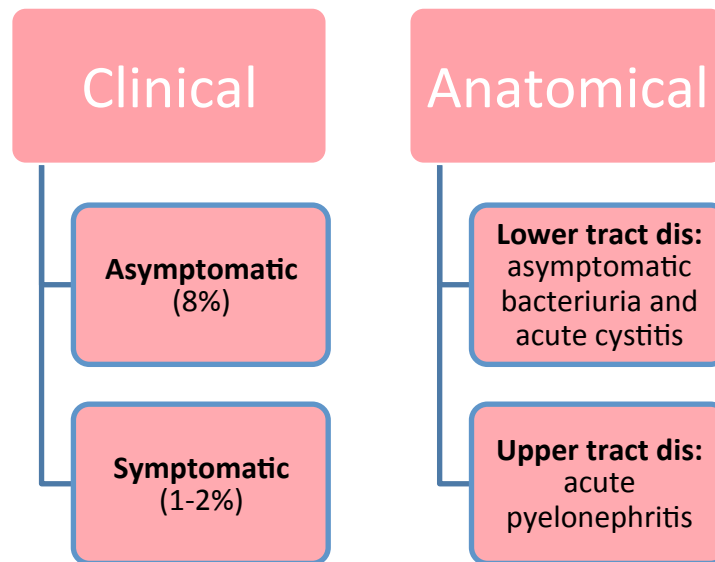
- ▶ Common medical complication of pregnancy (2-10%).
- ▶ Pathophysiology: ascending infection from vagina and rectum.
- ▶ **Most common causative organisms: gram -ve enteric bacteria** (e.g: **E.Coli** 60-80%, Proteus, K. Pneumoniae, Pseudomonas, and GBS).
- ▶ **Lactobacilli is normal flora and doesn't cause UTIs.**

- Risk Factors for UTI's in Pregnancy:

- ▶ Mechanical obstruction: ureteropelvic junction, urethral or ureteric stenosis, & calculi.
- ▶ Functional obstruction: **pregnancy** & vesicoureteral reflux.
- ▶ **Incomplete bladder emptying and vesicoureteric reflux encourage stasis of urine and bacterial growth. Pregnancy produces transient functional urethral obstruction both mechanically and hormonally.**

- ▶ Systemic diseases: DM, sickle cell trait/disease, gout, cystic renal disease.

- Classification of UTI's:



- Asymptomatic Bacteriuria (ABU):

- ▶ **Incidence** in pregnancy: 8%
- ▶ **Consequences:** acute pyelonephritis (30%).
- ▶ **Clinical presentation:** Usually asymptomatic .
- ▶ All pregnant women should be screened for bacteriuria and subsequently treated with antibiotics or they should be given prophylactic antibiotics if they were high risk patients.
- ▶ **Diagnosis:** culture (MSU).
- ▶ **Management:**
 - Outpatient Abx: amoxil, 1st generation cephalosporin, nitrofurantoin.
 - Length: 3-10 days (3 days for non pregnant, 7 days for pregnant, depends on the culture and abx type) → reculture.

-Acute Cystitis:

- ▶ **Incidence** in pregnancy: 1-2%
- ▶ **Consequences:** acute pyelonephritis (30%)
- ▶ **Clinical presentation:** urgency, hematuria, frequency, dysuria and suprapubic discomfort but there is no fever.
- ▶ **Diagnosis:** symptoms and culture (MSU).
- ▶ **Management:** outpatient Abx , analgesics.
- ▶ **Length:** 7-10 days → reculture

-Acute Pyelonephritis:

- ▶ **Incidence** in pregnancy: 1-2%
- ▶ **Consequences:** sepsis, adult respiratory syndrome, anemia, renal failure and preterm labor.
- ▶ **Clinical presentation:** fever/chills, CVA tenderness (costovertebral angle), nausea, vomiting and UTI symptoms.
- ▶ **Diagnosis:** symptoms, physical examination and lab: culture of urine and blood "to detect septecimia".
- ▶ **Management:**
Inpatient: 1- Admission 2- Antipyretic agents
3-Abx (i.v. ampicillin or cephalosporin (cefazolin) then p.o)
- ▶ **Length:** 7-14 days → reculture

- Types of UTI Recurrences:

- ▶ **Relapse:** same organism within 2-3 wks 2ndry to perineal colonization or inadequate Rx.

- ▶ **Reinfection:** new organism within 12 wks 2ndry to recurrent bladder bacteriuria.
- ▶ **Superinfection:** new organism while on Rx.
- ▶ **Prevention:** Prenatal screening for ASB in pregnant women

Summery

- Significant bacteriuria is generally accepted as a bacterial colony count of **10⁵** or more per milliliter of urine in a properly collected clean-catch specimen in an asymptomatic patient. Lower colony counts may be accepted in symptomatic patients.
- **E.coli** is the predominant organism in UTI 60% of cases.
- **Complications of a UTI during pregnancy:**
Maternal: sepsis – hypertension – preeclampsia- anemia- and amnionitis.
Perinatal: Premature labor - intrauterine growth retardation
- Recurrent UTI is diagnosed when two UTIs occur within **6** months or three or more occur during a single year.
- Entrance of bacteria into the urinary tract does not necessarily result in infection. Natural barriers for invasion, such as the “washout” effect of normal periodic voiding, the antiseptic properties of the bladder tissues, and the high concentration of organic acids in normal urine, prevent bacterial invasion. Other factors, such as a pH of less than 5 and urea ammonium and organic acid content of the urine, all affect bacterial growth. If invasion takes place, the bacteria may remain in the bladder or may ascend to the kidney.
- **Don't wait for the culture treat the patient then change the antibiotic once the culture is out.**
- **We do culture of urine as part of antenatal care.**
- **Urine dipstick is done initially but urine culture is confirmatory.**
- **25% of patients have recurrence later in pregnancy so re-culture is very important.**

MCQ's (Pretest):

When treating urinary tract infection (UTI) in the third trimester, the antibiotic of choice should be?

- a. Cephalosporin
- b. Tetracycline c
- c. Sulfonamide
- d. Nitrofurantoin

Answer:

The answer is a. Although quite effective, sulfonamides should be avoided during the last few weeks of pregnancy because they competitively inhibit the binding of bilirubin to albumin, which increases the risk of neonatal hyperbilirubinemia. Nitrofurantoin may not be tolerated in pregnancy because of the effect of nausea. It should also be avoided in late pregnancy because of the risk of hemolysis due to deficiency of erythrocyte phosphate dehydrogenase in the newborn. Tetracyclines are contraindicated during pregnancy because of dental staining in the fetus. Thus, the drugs of choice for treatment of UTI in pregnancy are ampicillin and the cephalosporins.

For feedback or mistakes

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