Urinary tract infections and asymptomatic bacteriuria in pregnancy

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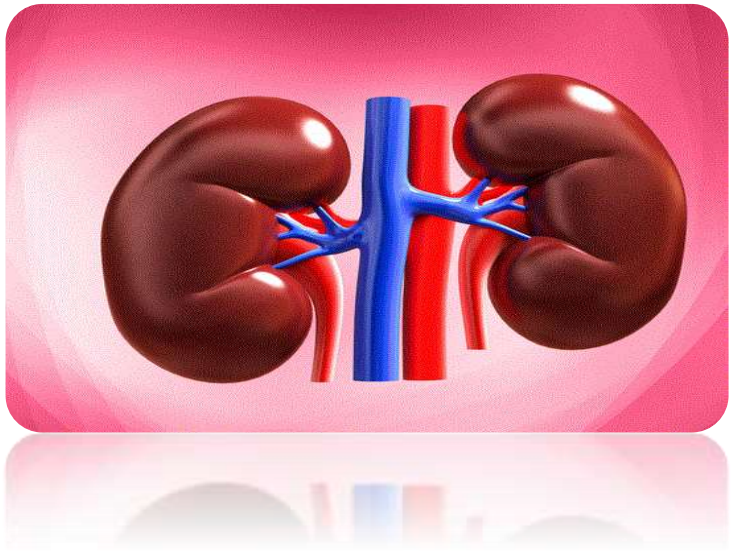

introduction

- Common in pregnant woman
- Lower tract(acute cystitis)
- Upper tract(acute pyelonephritis)

Epidemiology

- Incidence and risk factor:
- Asymptomatic bactriuria :the same as in nonpregnant woman
- Recurrent bactriuria :more common
- Pyelonephritis :is higher
- Asymptomatic bactriuria:2 to7 percent typically occures in early pregnancy
- Aquarter in second and third trimester

Risk factor:

- History of prior uti
- Pre-existing diabetes mellitus
- Increased pariety
- Low socioeconomic status

- Without treatment:20 to 35 percent developed symptomatic uti
- With treatment:70-80 percent reduced risk

- Acute cystitis:1 to 2 percent
- Acute pyelonephritis:0.5 to 2 percent
- Most cases during the second and third trimester

- Clinical characteristics associated with acute pyelonephritis:
- Prior untreated bactriuria
- age<20 yearts
- Nulliparity
- Smoking
- Late presentation to care
- Sickle cell trait
- Preexisting(not gestational)diabetes

Pregnancy outcomes

- Increased risk o preterm birth
- Low birth weight
- Perinatal mortality
- Increased risk of preclamsia
- Adverse pregnancy outcome of pyelonephritis:
- Anemia
- Sepsis
- ARDS

No difference by trimester

Pathogenesis

- Same species and similar virulence in nonpregnant women
- Facilitate the ascent of bacteria by
- : smooth muscle relaxation and subsequent ureteral dilation
- Pressure on bladder and ureters from enlarging uterus
- Immunosuppresion of pregnancy
- Lower levele of interlukin-6 and serum antibody responses to e.coli

Microbiology

- E.coli :predominant uropathogen
- Klebsiella
- Enterobacter
- Proteus
- Gram-positive organism :GBS
- Antimicrobial resistance:extended spectrum beta-lactamase

Lactobacillus or cutibacterium acnes:contamination specimen by vaginal or skin flora

Asymptomatic bactriuria

- Diagnosis:high level bacterial growth in urine culture in the absence of symptoms
- Screening:guideline of Infectiuse Diseases Society of America:
- at least once in early pregnancy
- 12 to 16 weeks gestation or the first prenatal visit with urine culture
- Rescreening is not performed in low risk woman

Specimen collection

- Minimize contamination
- Spread their labia and collect midstream urine
- Clean- catch:little value

Diagnostic criteria

- Isolation of the same bacterial strain in quantitative counts of >=10 colony –forming unites or single catheterized urine specimenwith one bacterial species isolated in a quantitative count>=10

- Rapid screening test shoud not be used

Management

- Antibiotic therapy
- Confirm sterilization of the urine

Antibiotics for asymptomatic bacteriuria and cystitis in pregnancy

Antibiotic	Dose	Duration	Notes
Nitrofurantoin	100 mg orally every 12 hours	Five to seven days	Does not achieve therapeutic levels in the kidneys so should not be used if pyelonephritis is suspected. Avoid use during the first trimester and at term if other options are available.
Amoxicillin	500 mg orally every 8 hours or 875 mg orally every 12 hours	Five to seven days	Resistance may limit its utility among gram-negative pathogens.
Amoxicillin-clavulanate	500 mg orally every 8 hours or 875 mg orally every 12 hours	Five to seven days	
Cephalexin	250 to 500 mg orally every 6 hours	Five to seven days	
Cefpodoxime	100 mg orally every 12 hours	Five to seven days	
Fosfomycin	3 g orally as single dose		Does not achieve therapeutic levels in the kidneys so should not be used if pyelonephritis is suspected.
Trimethoprim-sulfamethoxazole	800/160 mg (one double strength tablet) every 12 hours	Three days	Avoid during the first trimester and at term.

The durations listed in the table are based on data from studies conducted in both nonpregnant and pregnant women.

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- Optimal duration for asymptomatic bacteriuria is uncertain
- Fosfomycin

- Follow up:repeat culture aweek after completion of therapy

- There are insufficient data to support the use of supportive or prophylactic antibiotics for persistent or recurrent asymptomatic bacteriuria

Acute cystitis

- Dysuria
- Urinary urgency
- Frequency
- Empiric treatment
- Diffrential diagnosis:vaginitis,urethritis
- Women with persistant or recurrent bacteriuria,prophylactic or supportive antibiotics may be warranted in addition to retreatment

Tretment

- Cefpodoxime
- Amoxicillin-clavulanate
- Fosfomysin
- Nitrofurantoin

Management of recurrent cystitis:>=3 episode

Antimicrobial prophylaxis for the duration of pregnancy

Can be postcoital

Increase the risk of urinary complications during episode of cystitis(diabetes,sickle cell trait)prophylaxis after first episode of cystits

Daily or postcoital prophylaxis

- Low –dose nitrofurantoin :50-100mg
- Cephalexin:250-500mg

Acute pyelonephritis

- Symptoms the same as in nonpregnant women
- Fever ,flank pain ,nausea,vomiting,costovertebral angle tenderness,pyuria
- Symptom of cystitis are not always present
- Most cases occur during the second and third trimesters
- 20 percent :septic shock,ARDS,anemia,renal dysfunction
- Blood culture:in diabetic women
- Serum lactate level:in sepsis suspected severity of disease

Imaging

- Is not routinely used
- Indication :
- Severely ill patient
- Symptom of renal colic
- History of renal stone
- Diabetes
- History of prior urologic surgry
- Immunosuppression
- Repeated episode of pyelonephritis
- Urosepsis

Diffrential diagnosis

- Nephrolithiasis
- Intraamniotic infection
- Placenta abruption

Management

- Hospital admission
- Parentral antibiotic therapy for 24 to 48 hours afebrile
- Suppressive antibiotic for the remainder of pregnancy
- Empiric therapy

Parenteral regimens for empiric treatment of pyelonephritis in pregnancy

Antibiotic	Dose, interval
Mild to moderate pyelonephritis	
Ceftriaxone	1 g every 24 hours
Cefepime	1 g every 12 hours
Aztreonam*	1 g every 8 hours
Ampicillin PLUS Gentamicin¶	1-2 g every 6 hours 1.5 mg/kg every 8 hours
Severe pyelonephritis with an impaired immune system and/or incomplete urinary drainage	
Piperacillin-tazobactam	3.375 g every 6 hours
Meropenem	1 g every 8 hours
Ertapenem	1 g every 24 hours
Doripenem	500 mg every 8 hours

Doses are for patients with normal renal function.

- Fluoroquionolon and aminoglycosides should be avoided in pregnancy
- Switched to oral therapy guided by culture suseptibility results and discharged to complete 10 to14 days of tretment
- Oral option :beta-lactams,second trimester:trimethoprim-sulfamethoxazole
- Nitrofurantoin and fosfomysin are not appropriate

Obstetric management & preventing recurrence

- If the patient is septic tocolytic is generally avoided

- Recurrent pyelonephritis :6-8 percent
- Nitrofurantoin 50-100 mg at bed time
- Cephalexin 250 -500 mg at bedtime
- Urine culture repeated if is positive :course of antimicrobial therapy should be administered

Prevention in women wiyh history of pregnant women with history of recurrent UTI

- Single postcoital dose of cephalexin 250mg or nitrofurantoin 50 mg

Antibiotic safty in pregnancy

- Penicillins,cephalosporin,aztreonam are safe
- Cefriaxon :high protein binding….inappropriate the day before parturition
- Imipenem are not safe
- Fosfomysin is safe
- Trimethoprim-sulfamethoxazole is typically limited to mid pregnancy
- Tetracyclin should not be used
- Aminogycosides have been assosiated with ototoxicity following prologed fetal exposure

Thanks alot