URINARY TRACT INFECTIONS (UTIs) IN PREGNANCY

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INTRODUCTION

A. Pyelonephritis is the most common serious antepartum infection in obstetrics. Incidence varies but may be lowered by detection and treatment of asymptomatic bacteriuria in early pregnancy.

B. Production of STASIS predisposes to development of symptomatic urinary tract infection.
   - Hormonal action decreases ureteral tone and peristalsis.
   - Mechanical effect of enlarging uterus encroaches on the ureters as they cross the pelvic brim.
ASYMPTOMATIC BACTERIURIURIA (ASB).

A. GENERAL.

1. Undoubtedly ASB is the common denominator predisposing to acute renal infection.

1. ASB is defined as a significant number of virulent organisms in a patient with NO symptoms of urinary infection.

   a. Significant - 100,000 or more per cc of urine.
   b. Fewer probably represents contamination but repeat culture should be done (especially with 10,000-100,000 organisms/cc of urine.)
A. INCIDENCE

1. 2-3% in higher socioeconomic group.
2. 7-8% in lower socioeconomic group.
3. 1% of women free of ASB at initial screening develop urinary infection later.

A. ETIOLOGY - factors previously described producing stasis.
D. TREATMENT AND SUBSEQUENT RENAL DISEASE.

1. Prior to vigorous treatment of ASB, 25% of all women with ASB developed acute pyelonephritis.

2. Treatment (macrodantin QHS X 10 days) has reduced this to about 1-3%.

3. Of the remaining 75% with ASB, some have CHRONIC renal disease as the etiology.
   - Evidence of chronic pyelonephritis.
   - Obstructive uropathy.
   - Congenital anomalies.
III. CYSTITIS

A. DEFINITION - inflammation of bladder due almost invariably to bacterial infection.

B. SYMPTOMS.
   1. Dysuria.
   2. Frequency.
   3. Urgency.
   4. Hesitancy.
   5. Incontinence (occasionally).
A. ASSOCIATED FINDINGS.
   1. Headache.
   2. Low grade fever.
   3. Other signs of systemic infection.

A. URINALYSIS.
   1. WBC's.
   2. Bacteria.
   3. RBC's - occasionally.

A. TREATMENT - see below.
IV. ACUTE PYELONEPHRITIS.

A. GENERAL.

1. Implies disease involving renal pelvis, calyces, and parenchyma due to bacterial infection.

2. Often bilateral; if unilateral it is more common on RIGHT.

3. OCCURRENCE IN PREGNANCY 0.5 - 1%.
   a. Equal number ante and postpartum.
   b. Postpartum bladder especially vulnerable to colonization.
      ▪ Trauma at delivery to urethra.
      ▪ Residual urine in bladder.
A. HISTORY AND PHYSICAL.

1. Findings similar to nonpregnant patient.
   a. Often a prodromal history of lower tract symptoms.

   a. Followed by onset of:
      - FEVER.
      - CHILLS.
      - COSTOVERTEBRAL ANGLE PAIN (CVA pain).

   a. These latter symptoms may arise de novo.
1. **Associated findings.**
   - Anorexia.
   - Nausea.
   - Vomiting.

1. **PE findings.**
   - Fever.
   - Suprapubic tenderness.
   - Pain to CVA percussion.

1. **LAB findings on urinalysis.**
   - Pyuria.
   - WBC casts.
   - Bacteria.

1. **Urine culture positive - E. coli most common with Klebsiella, Enterobacteria, Enterococcus.**
C. DIFFERENTIAL

1. Any febrile illness.

2. CVA tenderness mistaken to originate from:
   - Acute appendicitis.
   - Chorioamnionitis.
   - Placental abruption.
   - Endoparametritis in postpartum state.
A. TREATMENT - see below.

B. PREVENTION.

- Detection and eradication of ASB.
- Avoidance of catheterization - if necessary, a short course of antimicrobial therapy may well be indicated afterwards.
Koss says that untreated ASB is associated with infants weighing < 2,500 gm (27%) and this percentage can be decreased with treatment to 7%.

Other investigators (Whalley, Little) have not been able to find such a relationship.
VI. TREATMENT OF URINARY INFECTIONS IN PREGNANCY.

A. ASB and CYSTITIS.
   1. Agents.
      a. Sulfonamides.
      b. Ampicillin.
      c. Nitrofurantoin.
      d. Tetracyclines.
      e. Cephalexin - high cost.
      f. Carbenicillin - high cost.
1. UNCOMPPLICATED ASB or CYSTITIS.
   a. Short acting sulfonamide achieves high urine level and is effective therapy in most cases.
      - May cause worsening of hyperbilirubinemia in the newborn, more so in premature infant.
   b. Ampicillin is a good drug but its similarity to penicillin raises the possibility of adverse reactions in patients sensitized to penicillin.
   c. Nitrofurantoin is effective, but may precipitate hemolysis in patients with G-6-PD deficiency.
      - Common in Black patients.
   d. Tetracyclines may discolor baby teeth of newborn.
      - Pregnant patients with impaired renal function may accumulate hepatotoxic levels.

2. Treatment should be for MINIMUM of 10 days. Followup cultures should be done.
A. ACUTE PYELONEPHRITIS.

1. IV fluids.

2. Antibiotics (IV).
   - Urine culture and sensitivity done before therapy started.
   - Patient already being treated for ASB and develops pyelonephritis should NOT be treated with same drug.
1. Improvement should be rapid. 85% of patients were afebrile and asymptomatic in 48 hrs in one study.

2. Treatment continued for 10 days. Followup cultures obtained.

3. 1/3 of patients will demonstrate ASB or recurrent symptomatic urinary tract infections late in pregnancy or postpartum period.

4. If no improvement in 48-72 hrs, urinary obstruction (calculus, perinephric abscess) must be considered.

5. ARDS can result from endotoxin induced alveolar injury - rare.
## Standard therapy

<table>
<thead>
<tr>
<th>Substance</th>
<th>Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fosfomycin trometamol</td>
<td>3000 mg SD</td>
<td>1 day</td>
</tr>
<tr>
<td>CiproXR *</td>
<td>500 mg od</td>
<td>3 days</td>
</tr>
<tr>
<td>Levofloxacin *</td>
<td>250 mg od</td>
<td>3 days</td>
</tr>
<tr>
<td>Ciprofloxacin *</td>
<td>250 mg bid</td>
<td>3 days</td>
</tr>
<tr>
<td>Norfloxacin *</td>
<td>400 mg bid</td>
<td>3 days</td>
</tr>
<tr>
<td>Ofloxacin *</td>
<td>200 mg bid</td>
<td>3 days</td>
</tr>
<tr>
<td>TMP-SMX *</td>
<td>160/800 mg bid</td>
<td>3 days</td>
</tr>
<tr>
<td>Trimethoprim (TMP) *</td>
<td>200 mg bid</td>
<td>5-7 days</td>
</tr>
<tr>
<td>Pivmecillinam</td>
<td>200 mg bid</td>
<td>7 days</td>
</tr>
<tr>
<td>Nitrofurantoin</td>
<td>50-100 mg fit</td>
<td>5-7 days</td>
</tr>
<tr>
<td></td>
<td>100 mg SR bid</td>
<td></td>
</tr>
</tbody>
</table>

*Resistance rate of E.coli varies considerably within Europe. These substances are only recommended for empiric therapy, if resistance rate of E. coli is <(10%-20%). CiproXR - ciprofloxacin sustained release; SMX - sulfamethoxazole; od - once daily; bid - twice daily, fit - four times daily, SD - single dose; SR - sustained release.

Naber, KG, 2005
Bacteriuria in Pregnancy: CLINICAL TRIAL REVIEW

Marone et al., 1988

- Pipemidic acid (n = 156) - 93.5%
- Fosfomycin trometamol (n = 209) - 94.4%

Kremery et al., 2001

- Ceftibuten (n = 20) - 90.0%
- Fosfomycin trometamol (n = 21) - 95.2%

N = 295

Monuril is approved by USA FDA in category B. Usage during pregnancy has demonstrated consistent success without the risk of untoward effects and minimal rates of recurrences when compared with other drugs.
MONURIL- THERAPEUTICAL APPLICATIONS

- Adults acute cystitis
- Pediatrics
- Female recurrent cystitis
- Cystitis during pregnancy
- Asymptomatic bacteriuria during pregnancy
- Prophylaxis in diagnostic manoeuvres (endoscopy, etc…)
- Prophylaxis in uroginecological surgery
- Prophylaxis in urethral catheterism
First line therapy of Acute Cystitis: why fosfomycin remains ideal

- Proven clinical efficacy in numerous well designed and performed peer-review-published studies (Lobel, 2003)
- Excellent tolerability and safety (Lobel, 2003)
- Effective in eradicating UTI in pregnancy
- Minimal incidence of recurrences
- Cost comparable to that of less effective drugs
In view of the potential advantages of single-dose therapy in terms of patients compliance and safety we could recommend that fosfomycin trometamol 3g be the first line treatment of uncomplicated bacteriuria in pregnancy.

N. Ragni
Thank You