Mircobiology Team

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Management of Urinary Tract Infections

Very important Important Explanations/mentioned by the doctor

Very important notes:

- For Uncomplicated UTI, the best duration to give antibiotics is **7 days**
- The **most commonly** used drug for prophylaxis against Lower UTIs (Cystits) is **Nitrofurantoin** (if NF is not in the answers choose Trimethoprim/sulfamethoxazole, cephalosporins)
- Asymptomatic Bacteriuria : treat only if pregnant
- Ciprofloxacin is a good drug, works in Lower and upper UTIs; But **CONTRAINDICATED** in pregnancy because it cause cartilage damage. In general, fluoroquinolone (ciprofloxacin or norfloxacin) are contraindicated.
- Avoid Ceftriaxone 1 day before delivery, nitrofurantoin and trimethoprim in the first trimester **(in general avoid all antibiotics but if needed use beta-lactam)**
- A patient allergic to penicillin should not be given B-lactam antibiotics such as Ceftrixone, Cephalosporins, Amoxcilin
- Uncomplicated/Lower UTI/non-pregnant women: treat for **3-7d** NOT LESS than 3d
- Complicated/Upper UTI: treat for **10-14 days**

❖ **Goal for treatment**

To eradicate the offending organisms from the urinary bladder and tissues.
The main treatment of UTI is by antibiotics. Other methods

❖ **Choice of antibiotic depends on**

- Whether infection is complicated or uncomplicated.
- Whether infection is primary or recurrent.
- Type of patient (pregnant ,child , hospitalized or not, diabetic patient,…..etc)
- Bacterial count.
- Presence of symptoms.

❖ Uncomplicated UTI (not a pregnant women)

- **Treatment lasts 3 days; not less**
- Recovery rate if we treat for 3d = 94%, for 5-7d = 100%
- Choice of antibiotic depend on susceptibility pattern of bacteria:

1- Amoxicillin (with or without clavulanate)
2- Cephlosporins (first or second generation) – 1st and 2nd because it's uncomplicated UTI
3- Fluoroquinolone (ciprofloxacin or norfloxacin)(not for pregnant women or children) , first choice if other antibiotics are resistant.
4- TMP-SMX (trade names: Bactrim, Septra ,Cotrimoxazole)
5- Nitrofurantoin (for long term use)

❖ Complicated UTI

- Treat at least 7 days, but **10-14d is the optimal**, and not more than 14 days

❖ Relapsing infection (The symptoms will disappear but the infection is still there by the same organism)

- Caused by treatment failure or structural abnormalities or abscesses.
- Antibiotics used at the initial infection
- Treatment is similar to complicated, for **7-14 days**

❖ Recurrent infections (Infection is reoccurring over and over; with the same organism or a different one)

- Patients with ≥2 symptomatic UTIs within 6 months, or ≥3 over a year.
- **Need preventive therapy** (prophylaxis)
- Antibiotic taken as soon as symptoms develop.
- If infection occurs less than twice a year, a **clean catch urine test should be taken for culture** and treated as initial attack for 3 days.

❖ **When to consult the doctor?**

- If symptoms persist
- Pregnant women
- Impaired immune system
- Structural abnormalities of urinary tract
- A change in symptoms
- More than 4 infections per year
- Previous kidney infections
- History of infection with antibiotic resistant bacteria.

❖ Postcoital antibiotics (after the sexual intercourse)

- The main risk factor of UTI in females is the sexual intercourse
- If recurrent UTI is related to sexual activity, and episodes recur >2 within 6 months
- A single oral preventive dose taken immediately after intercourse
- Antibiotics include: TMP-SMX, Cephalexin or Ciprofloxacin

❖ Prophylactic antibiotics

- Optional for patients who do not respond to other measures.
- Reduces recurrence by up to 95%
- **Low dose antibiotic taken continuously for 6 months or longer, it includes :**
- TMP-SMX, **Nitrofurantoin** is the commonly used oral antibiotic for prophylaxis, or Cephalexin
- Antibiotic taken at bed time more effective.
- We give prophylaxis to patients that have recurrent infections or congenital anomalies.
- The problem is patients on prophylaxis develop resistance.
- We give half the dose.

❖ Uncomplicated pyelonephritis (without vomiting; we can give oral antibiotics)

- Patients with fever, chills and flank pain, but they are healthy non-pregnant ,not nauseous or vomiting with no signs of kidney involvement.
- Can be treated at home with oral antibiotics for **10-14 days** with one of the followings:

- Cephalosporins, Amoxicillin-Clavulanate, **Ciprofloxacin** (has good bioavailability)**, Ceftriaxone** (Long duration) or TMP-SMX.
- Ciprofloxacin is the 1st choice in this case; unless if we need a long acting antibiotic or if the rate of resistance to Ciprofloxacin is high we use Ceftriaxone.
  - First dose may be given by injection
  - **Nitrofurantoin is CONTRAINDICATED in pyelonephritis because it doesn't have an action on the kidney's tissue.**
  - A urine culture may be obtained within one week of completion of therapy and again after 4 weeks. (in lower UTI you don't need to culture unless if the infection isn't relieved)

❖ Moderate to sever pyelonephritis (Complicated) (with vomiting)

- **Patients need hospitalization**
- Antibiotic given by **IV route** for 3-5 days until symptoms relieved for 24-48 hrs. Then you stop IV and discharge patient with oral antibiotics e.g. Ciprofloxacin.
- If fever and back pain continue after 72 hrs of antibiotic, imaging tests indicated to exclude abscesses, obstruction or other abnormality. (If abscesses are there, we need to drain it because antibiotics do not work on necrotic tissue)

❖ Chronic pyelonephritis

- Those patients need long-term antibiotic treatment even during periods when they have no symptoms.

Treatment of specific populations:

Specific Cases	Risks & Infections	Management
Pregnant women	• **High risk for UTI and complications** • Should be screened for UTI Asymptomatic bacteriuria is only treated in pregnant women	**Antibiotics during pregnancy includes:** • Amoxicillin, Ampicillin, Cephalosporins, and Nitrofurantoin. • **Pregnant women should NOT take Quinolones e.g. Ciprofloxacin** *(this drug can damage the cartilage)* **Asymptomatic Bacteriuria (evidence of infection but no symptoms):** • Have 30% risk for acute pyelonephritis in the second or third trimester. • Screening and **3-5 days antibiotic needed.** For complicated UTI, need 7-10 days antibiotic treatment.
Diabetic Patients	Have more frequent and more sever UTIs *specially cystitis*	Treated for 7-14 days with antibiotics EVEN patients with uncomplicated infections.
Urethritis In Men	*Are not always caused by E coli they're maybe due to STD but present like cystitis common etiology are Neisseria gonorrhoeae, & Chlamydia trachomatis*	• Require 7 days regimen of Doxycycline. • A single dose Azithromycine may be effective but *not recommended* to avoid spread to the prostate gland. • Patients should also be tested for accompanying STD.
Children With UTI	–	• Usually treated with TMP-SMX or Cephalexin. • Sometimes given as IV. • Gentamicin may be recommended as resistance to Cephalexin is increasing. • *Check for abnormalities*
Vesicoureteric Reflux (VUR)	• Common in children with UTI • Can lead to pyelonephritis and kidney damage.	• Long-term antibiotic **plus** surgery used to correct VUR and prevent infections. *(It's very important to screen children > 3 years if not treated it can lead to scarring and kidney damage)* • **Acute kidney infection:** use **Cefixime** *(the only 4th generation cephalosporin taken orally)* (Suprax) or 2-4 days **Gentamicin** in one daily dose. Oral antibiotic then follows IV.
Catheter-Induced UTI	▸ Very common ▸ Preventive measures important ▸ Catheter should not be used unless absolutely necessary and they should be removed as soon as possible. ▸ Catheterized patients who develop UTI with symptoms or at risk for sepsis should be treated for each episode with antibiotics and catheter should be removed, if possible. ▸ Associated organisms are constantly changing. ▸ May be multiple species of bacteria.	• If catheter is required for long periods it is best to be used intermittently. • May be replaced every 2 weeks to reduce risk of infection and irrigating bladder with antibiotics between replacements • Daily hygiene and use of closed system to prevent infection. • Antibiotic use for prophylaxis is rarely recommended since high bacterial counts present and patients do not develop symptomatic UTI. • ANTIBIOTIC THERAPY HAS LITTLE BENEFIT IF THE CATHETER IS TO REMAIN IN PLACE FOR LONG PERIOD.

Questions

1) A patient diagnosed with uncomplicated UTI should be treated with amoxicillin for:

    a. 1 day
    b. 5 days
    c. 2 days

2) Which one of these drugs are contraindicated in pregnant women:

    a. Ciprofloxacin
    b. Amoxicillin
    c. Cephalosporins

3) Asymptomatic Bacteriuria should be treated in which of these cases:

    a. Urethritis in men
    b. Pregnant women
    c. Diabetic patient

4) Which drug is contraindicated in uncomplicated pyelonephritis

    a. Ciprofloxacin
    b. Nitrofurantoin
    c. Ceftriaxone

5) A patient having recurrent infections wanted to reduce the recurrence of infections he should take:

    a. Cephalexin
    b. Ceftriaxone
    c. Amoxicillin

Ans

1)B – 2)A – 3)B – 4)B 5)A