Management of Urinary Tract Infections

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Objectives

1- Recall the principal goal of management of urinary tract infection (UTI) and that antibiotics are the main treatment of UTI

2- Discuss the factors that management of UTI depends on

3- Describe the management/treatment of different conditions of UTI (cystitis, pyelonephritis, catheter associated UTI ,etc.)

Goal of Management of UTI

The principal goal of management of UTI is to eradicate the offending organisms from the urinary bladder and tissues.

The main treatment of UTI is by antibiotics.

Management of UTI 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

Low-risk patient (woman) for recurrent infection:

3 days antibiotic without urine test.

Cure rate 94%.

Choice of antibiotic depend on susceptibility pattern of bacteria, it includes ;

Amoxicillin (with or without clavulanic acid)

Cephlosporins (first or second generation)

Fluoroquinolone (ciprofloxacin or norfloxacin)
(not for pregnant women or children under 18 year) ,first choice if other antibiotics are resistant.

TMP-SMX (trade names: Bactrim, Septra ,Cotrimoxazole)

Nitrofurantoin (for long term use)

Relapsing infection

Caused by treatment failure or structural abnormalities or abscesses.

Antibiotics used at the initial infection

Treatment for 7-14 days.

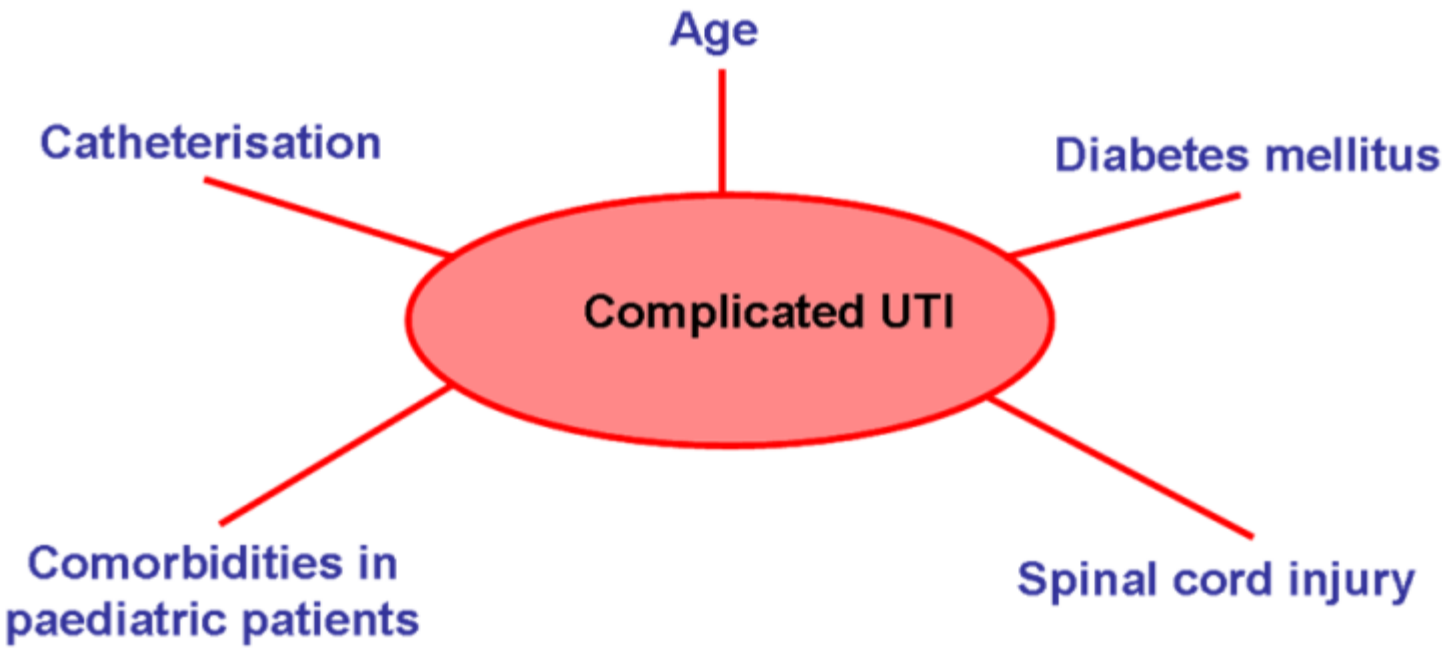
Recurrent infections

Patients with two or more symptomatic UTIs within 6 months or 3 or more over a year.

Need preventive therapy

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.


Age
Catheterisation
Diabetes mellitus
Complicated UTI
Comorbidities in paediatric patients
Spinal cord injury

When to consult the doctor ?

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

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, or Cephalexin

- Antibiotic taken at bed time more effective.

Uncomplicated pyelonephritis

- Patients with fever, chills and flank pain but they are healthy, non-pregnant, female, without relevant comorbidities and without structural or functional urinary tract abnormalities

- Can be treated at home with oral antibiotics for 14 days with one of the followings:

Cephalosporins, Amoxicillin-Clavulanic acid, Ciprofloxacin or TMP-SMX.

- First dose may be given by injection

Moderate to sever pyelonephritis

Patients need hospitalization

- Antibiotic given by **IV route** for 3-5 days until symptoms relieved for 24-48 hrs.
- If fever and back pain continue after 72 hrs of antibiotic**, imaging tests** indicated to exclude abscesses, obstruction or other abnormality.

Treatment of specific populations

Pregnant women

- High risk for UTI and complications
- Should be screened for UTI
- Antibiotics during pregnancy includes;;

Amoxicillin, Ampicillin, Cephalosporins, and Nitrofurantoin.

- Pregnant women should NOT take Quinolones.

- Pregnant women with asymptomatic bacteriuria *(evidence of infection but no symptoms)* have 30% risk for acute pyelonephritis in the second or third trimester. Screening and 3-7 days antibiotic needed.
- Acute cystitis during pregnancy usually treated within 7 days of abx

Diabetic patients

- Have more frequent and more sever UTIs.
- Treated for 7-14 days with antibiotics even patients with uncomplicated infections.

Urethritis in men

- Most important causes:
  - *Neisseria gonorrheae*
  - *Chlamydia trachomatis*

- Treated with **IM Ceftriaxone + Doxycycline or Azithromycin.**

- 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.

Vesicoureteric reflux (VUR)

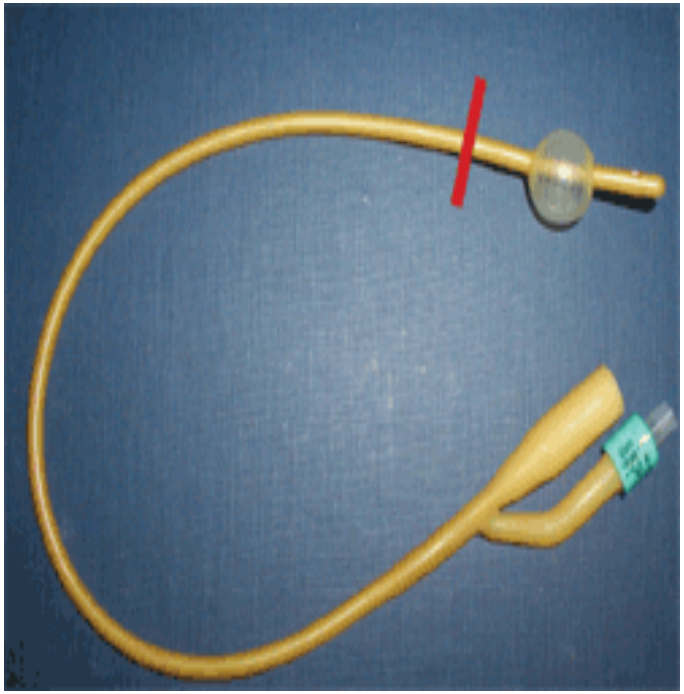
- Common in children with UTI
- Can lead to pyelonephritis and kidney damage.
- Long-term antibiotic **plus** surgery used to correct VUR and prevent infections.
- Acute kidney infection : use Cefixime (oral) or IV Ceftriaxone or **Gentamicin** a one daily dose for 2-4 days followed by oral treatment eg. amoxicillin-clavulanic acid or TMP-SMX .


Grade V

Management of 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.

Urinary catheter



Intermittent use of catheters

- 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.**

Catheter induced infections

- 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.

continue–

- 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.

Reference

- Ryan, Kenneth J. Sherris Medical Microbiology. Latest edition. McGraw –Hill Education