

URINARY TRACT INFECTION (UTI)

BY:

PROFESSOR SALIH BIN SALIH

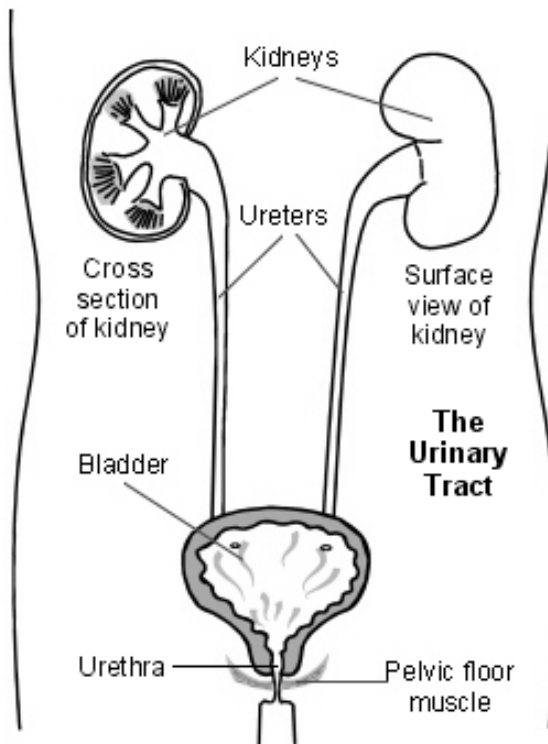
Chairman, Department of Medicine

King Abdulaziz Medical City, Riyadh

Professor of Medicine, College of Medicine

King Saud Bin Abdulaziz University for Health Sciences (KSAU-HS)

URINARY TRACT



UTI

- * Pyelonephritis (infec. In the kidney)
- Cystitis
- Urethritis
- prostatitis

- COMMONEST IS CYSTITIS & URETHRITIS, specially in women
- Cystitis is uncommon in young men.

NATURAL DEFENCES

Factors which prevent infection naturally

- Free flow of urine (no obstruction)
- Acidic urine (acidity kills bacteria)
- Complete bladder emptying (no stasis).
Remember, stasis of urine is bad.
- Urinary tract epithelium secretes substances which are anti-bacterial.

DEFENCES (contd.)

ANY BREAK IN THIS CHAIN CAN CAUSE UTI

RISK FACTORS

- Female gender
- Old age (even males)
- DM
- Structural abnormality of urinary tract (causes stasis) eg. diverticulum in the bladder or ureter
- Obstruction of the urinary tract (stone, BPH)
- Pregnancy (causes urine stasis)
- Foley's catheter

WHAT IS COMPLICATED UTI?

If UTI occurs in the presence of any of these:

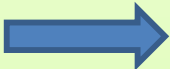
- a) Anatomical abnormality in the urinary tract
- b) Stones in the tract
- c) DM
- d) Poor immunity (eg HIV, patient on long term -
----- ?)
- e) Presence of Foley's catheter

If no, then its called an uncomplicated UTI

PATHOGENS CAUSING CYSTITIS

- **E.Coli** : Most common cause.
- **Proteus**(12%) **Klebsiella** (4%), **Pseudomonas**
- **Staph. Saprophyticus**(10%)
 - * Normal flora of the female genital tract but can cause UTI also
- **Candida Albicans** (fungus): Causes UTI if immunity is low.

S/S OF CYSTITIS

- Dysuria, increased frequency, nocturia
- Suprapubic pain & tenderness
- Cloudy & very foul urine smell
- Fever uncommon in young patients
- In children  fever more common

S/S IN OLD PATIENTS

- Typical signs & symptoms often absent
- Common S/S are:
 - * Confusion, drowsy
 - * Change in behavior, irritable
 - * Not feeling well, anorexia, weakness
 - * Incontinence

(any infection in old people can present with the above symptoms)

INVESTIGATIONS

```
graph TD; A[INVESTIGATIONS] --> B[Urine analysis]; A --> C[Urine C/S]; A --> D[Imaging];
```

Urine analysis

Urine C/S

Imaging

INVESTIGATIONS

1) Urinalysis : Take a clean, midstream, freshly voided sample (or catheter sample)

* **Bacteria:**

~ In females, 10^5 /ml of urine diagnostic of

~ In males, 10^2 /ml of urine UTI

* **Nitrite:** positive (produced by bacteria)

* **WBCs** : more than 8-10/ high power field

* **Leucocyte Esterase:** positive (an enzyme produced by WBCs)

* **RBCs** : may be present or absent

DIPSTICK TEST (a quick test **but not ideal**)





- 2) Urine C/S

- * Not recommended in every case

- * Result takes 48-72 hrs

- * Recommended in :

- **pregnancy**

- **DM**

- **recurrent UTI**

- **Failure to respond to Rx**

3) **IMAGING** : i.v.Pyelogram, u/s, CT (with contrast)

- Not done routinely
- Done in the following :
 - a) Recurrent UTI : To find out any abnormality in the urinary tract eg stone, BPH, diverticulum
 - b) In children (UTI is very rare in children, so if they have it, should rule out any structural abnormality)

i.v. pyelogram (I.V.P)



MANAGEMENT OF UTI (MAINLY CYSTITIS)

- 1) Antibiotics
- 2) High fluid intake
- 3) Cranberry juice(?)
- 4) Remove/replace catheter, if present

Antibiotics are started empirically, then modified according to culture reports, if needed

MANAGEMENT (contd.)

1) YOUNG FEMALES WHO ARE NOT PREGNANT

* First choice : Tmp/Smx (**Bactrim**)DS ,1 tab.
bid., or **Nitrofurantoin** or **Fosfomycin**

* Second choice : Ciprofloxacin (quinolones)
(according to infec. Dis. Society of America)

ONE OF THEM, FOR 3 DAYS

(resistance to cipro is very high in many countries)

Management (contd)

2) MALES :

- * Same

- * **7 day Rx (not 3 days)**

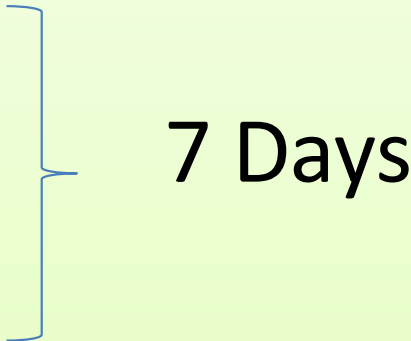
In 1) & 2) no need to do a urine C/S after treatment.

UTI IN PREGNANCY

- 1) 6% of preg. females have significant bacteria in urine, even without UTI symptoms. If not treated, it can cause pyelo-nephritis
(can lead to maternal & fetal complications)
- 2) Routine urine C/S is done in the 1st trimester
- 3) Rx is given **even if no symptoms** (asymp. bacteriuria)
- 4) Rx of choice : * Nitrofurantoin
* Fosfomycin

TREAT FOR 7 DAYS (NOT 3 DAYS)

DURATION OF CYSTITIS TREATMENT

- 1) Non-pregnant female: 3 days
 - 2) Males
 - 3) Pregnant female
 - 4) DM
- 7 Days
- 

SPECIAL SITUATIONS

- 1) Asymptomatic bacteriuria : Treat only :
 - a) If the patient is pregnant
 - b) If the person is going to have any **urologic** surgery(if the pre-op routine tests show bacteria in urine)

PROPHYLAXIS FOR RECURRENT UTI

If a patient gets recurrent UTI, do the following:

- 1) Advise increased fluid intake
- 2) Frequent urination(to avoid stasis in the bladder)
- 3) Investigate for any urinary tract pathology (by ultrasound / pyelogram etc) & treat it
- 4) Do urine culture(to see if any antibiotic resistance is there)

Special situations

Chronic indwelling Foley's catheter

- * WBC & bacteria are almost always present
- * No treatment if patient is asymptomatic
- * Treat w/antibiotics only if symptoms present
- * Change Foley's catheter

ACUTE PYELONEPHRITIS

- It is infection of the renal parenchyma
- Mostly due to ascending infection from below
- S/S : Same as lower UTI + fever, loin pain
- Invest. : * Urine analysis * Urine C/S * Blood C/S, Imaging studies if needed
- Rx : 1) Co-amoxiclav (Augmentin)
- 2) Cipro/levofloxacin
- 3) i.v. gentamycin, 3rd gen. cephalosporins

Depending on the severity, patient may need oral or iv antibiotics.

SUMMARY

- 1) Commonest bacteria: E.Coli, then Klebsiella, Proteus
- 2) UTI more common in females
- 3) Treatment with antibiotics usually for 3 days
- 4) Treatment for 7 days in males, pregnancy, DM
- 5) In pregnancy, if bacteria are present in urine, treat it, even if asymptomatic
- 6) Obstruction in the urinary tract → increased risk of UTI
- 7) Antibiotics used:
 - * Non-pregnant female: Bactrim, nitrofurantoin, fosfomycin, cipro
 - * Males: Same as above for 7 days
 - * Pregnancy: Nitrofurantoin, fosfomycin

THANK YOU!!!