Definitions

- **UTI**
  - Inflammatory response of the urothelium to bacterial invasion associated with bacteriuria and pyuria.
  - **Cystitis**
    - Clinical syndrome of dysuria, frequency and urgency.
    - Generally indicative of bacterial cystitis, however may be associated with other conditions (cancer, IC, other causes)
  - **Acute Pyelonephritis**
    - Chills, fever and flank pain accompanied by bacteriuria and pyuria, indicative of a kidney infection
UTI – Definitions

• Unresolved
  • Not responded to antibiotics
• Recurrent
  • Occurs after documented successful resolution of antecedent infection
    • Reinfection – new event associated with reintroduction of bacteria into urinary tract from outside
    • Relapse (bacterial persistence) – recurrent UTI caused by same bacteria re-emerging from a focus within the urinary tract (stone, prostate, bladder)

Note: A patient with clinical cystitis with pnematuria and/or feculuria - think a colo-vesical fistula.
Of recurrent infections
  • Reinfection 95% - 99%
  • Relapsing (bacterial persistence) : 1% - 5%
    • Can usually be cured by identification and surgical removal or correction of the focus of infection
Reinfection Principle

Patients with reinfection usually do not have an alterable urologic abnormality and require long-term medical management.
Causes of Bacterial Persistence (Relapsing UTI)

- Infection Stone (STRUVITE)
  - Pathogenesis: Bacterial that split the substance “urea” with an alkaline urine and concentration of carbonate and ammonia could form stones.
  - The most common urease-producing bacteria include
    - Proteus, Klebsiella, Pseudomonas, and Staphylococcus
Other Causes of Relapsing UTI’s

- Foreign bodies (surgical debris)
- Infected atrophic kidney
- Urethral diverticula
- Chronic bacterial prostatitis
- BPH with elevated PVR / incomplete bladder emptying
Asymptomatic Bacteriuria (ASB)

- Principles of therapy
  - In adults without risk factors
    - ASB is NOT harmful
    - Increased risk of UTI but treatment does not reduce risk of symptomatic UTI’s
    - Screening not recommended except in select group
Who gets Screened/Treated for ASB?

- Pregnant women
- Patients to undergo urologic surgery

Not recommended to screen:
- Patients with indwelling catheters
- Elderly, institutionalized patients
Who gets a work up for recurrent UTI’s?

- Relapsing UTI’s
- Reinfection if:
  - LUTS (lower urinary tract symptoms)
  - Elevated PVR
  - Possible neurogenic bladder
  - Prior LUT surgery
- Pyelonephritis's
  - Unresponsive to therapy
  - Recurrent
What is the work up?

Always:
- HX
- PE
- PVR

Sometimes:
- Uroflow
- Urodynamics
- Cystoscopy
- Imaging of the upper/lower tracts
Differential DX of persistent “cystitis”

- Bacterial cystitis
- Vaginitis (bacterial vaginosis)
- Yeast vaginitis
- Sexual trauma
- STD’s - herpes, gonorrhea, chlamydia, trichomonas
- Chemical allergic irritation
- IC/PBS
- Bladder cancer (may not have microscopic or gross hematuria)
- Carcinoma in situ
Management of re-infection (not relapsing)

• Hygiene measures:
  • Voiding after coitus, lubricants, toilet hygiene, bowel regularity
• Daily prophylaxis
  • TMP
  • TMP/SMX
  • Ampicillin
  • Nitrofurantoin

• Other treatments
  • Post-menopausal
    • Consider local estrogen
  • If post coital UTI
    • Consider post-coital prophylaxis
  • Self start regimen
24 year old female presents with dysuria, frequency, urgency X 2 days. UA: Shows leukocytes and RBC’s

The preferred therapy is:
A) TMP/SMX  BID x 3 days
B) Cipro 500 mg, PO x 1 day
C) TMP/SMX BID x 7 days
D) Cipro 250 mg, PO BID x 7 days
E) Ampicillin 500 mg, PO x 5 days
82 year old female without LUTS is referred due to 3 consecutive urinalysis with 3-5 leukocytes per HPF over 3 month. She has 3 courses of antibiotics, urine dipstick in your office shows leukocytes.

The diagnosis is:
A) Cystitis
B) Asymptomatic pyuria
C) Asymptomatic bacteriuria
D) Recurrent UTI’s
DIPSTICK PITFALLS

Leukocyte False Positive: Esterase Contamination

False Negative:
Elevated specific gravity, glycouria, ketonuria, proteinuria, some oxidizing agents (cephalexis, nitrofurantoin, tetracycline, Vitamin C).

Nitrites:
False positive:
Contamination, exposure of dipstick to air, pyridium.

False negative:
Elevated SG, elevated urobilinogen levels, nitrate reductive, negative bacteria,
PH < 6.0 and vitamin C.
82 year old asymptomatic female without LUTS in a skilled nursing home facility is referred for evaluation of 3 positive urine cultures revealing the same organism despite 3 courses of oral antibiotic. Urinalysis has been negative.

A) CT, cysto and possible urodynamics
B) Daily low dose antibiotic prophylaxis
C) 14 days of CX specific antibiotics
D) Observation
Thank you for your time!

We appreciate your attendance.

Pete Tucker