Geriatric Urinary Tract Infections

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UTIs

- Bladder infections 50x more common in women than men
- 1 in 5 women will have bladder infection at some point in their lives
- Bladder infections account for 8 million office visits a year in US

UTIs: Geriatric Population

- UTI most common illness in adults 65 yo and older
- Incidence of UTIs is nearly 10% in women and 5.3% in men over age 80

UTI: Definition

- The result of the interaction of pathogens in the urinary system and human host response to the pathogen
- Treatment needed

Geriatric Host

- Older adults are at greater infection rate due to immune senescence, comorbidities, and communal residence
- Typical signs or symptoms of infection may be absent in older adults: blunted febrile response, nonspecific decline in function
- Genitourinary sources of bacteremia more common. Mortality is increased with bacteremia in older adults.

Geriatric Patients: UTI or Not?

- 75 yo asymptomatic woman with bacteruria
- 65 yo diabetic male with urinary frequency, urgency, dysuria and bacteruria
- 80 yo female nursing home resident, afebrile, mental status changes and bacteruria
- 85 yo male with indwelling foley, fever and bacteruria

79 yo healthy community dwelling woman with acute onset of dysuria, urgency, urinary frequency

Think geriatric UTI or not?

UTI: Definition

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Asymptomatic Bacteruria

- Women: prevalence healthy women increases with age
  - 1% schoolgirls, > 20% 80+yo community dwellers
  - Increased with sexual activity (greater in premenopausal married women vs. nuns)
  - Pregnant vs. Nonpregnant: same 2-7%
  - Diabetic women 8-14%
  - Young women usually transient: usu few weeks

Asymptomatic Bacteruria

- Men:
  - Rare in healthy young men
  - Men 75yo +in community 6-15%
  - No difference between diabetic and nondiabetic men

Asymptomatic bacteruria

- Whom to treat:
  - pregnant women
  - Patients undergoing urologic procedures
- Whom to NOT treat:
  - Women, diabetic patients, elderly, SCI pts, pts with indwelling catheters

UTI: pathogenesis, etiology

- Bacterial entry: ascent of bacteria from periurethral area (from rectum)
- Bacterial uropathogenic factors:
  - adhesion (pili)
  - colonization/biofilms, limit bacteriocidal activity
  - Mediators increase tissue invasivenesss, hemolysin

"Geriatric Bacterial Resistance"

- MRSA, VRE, Multi-resistant GNB are more frequent causes of infection among institutionalized older patients than those who are community-dwelling.
- Antibiotic resistance is fostered in the NH setting by debilitated hosts, close proximity of residents and persistent antibiotic pressure.
  - Canadian study: 8-17% NHR were taking antibiotics at any given time, 50-70% exposed over/year and 22-89% of antibiotic use was inappropriate.

Host defenses

- Mechanical: urethral length, bladder emptying
- Biochemical: acid ph, high urea content, high osmolality
- Physiologic: systemic/local antibody production, estrogenized vagina:biologic barrier
- Genetic: HLA/Lewis blood group antigens associated with increased bacterial colonization, adherence

Estrogen and the Vagina

- Lowers vaginal ph
- Suppports environment for lactobacillus (produces lactic acid, inhibits enteric pathogens)
- Improves vaginal blood flow, vaginal thickness and elasticity
- Increases maturation of vaginal and urethral mucosal cells
- Reduces number of UTIs in post-menopausal women

Compromised Geriatric Host Defenses

- Mechanical: incomplete bladder emptying
  - Impaired detrusor contractility: “bladder failure”
  - DHIC: detrusor hyperactivity with impaired contractility, common voiding dysfunction in elderly
  - Prostatic hypertrophy
  - Pelvic prolapse/cystocele

Compromised Geriatric Host Defenses

- Mechanical
  - Condom catheters (chronic): 85% colonized vs. 100% Foley
  - Foley catheters: Bacteruria 3-10%/day of catheterization, 10-25% develop UTI
    - Extraluminal: infection occurs via biofilm formed around catheter (66% of infections)
    - Intraluminal: infection occurs due to stasis from drainage failure or contamination of drainage bag
    - Removal: UTIs occur more commonly in 65+yo women

Compromised Geriatric Host Defenses

- Physiologic
  - Vaginal atrophy
  - Alterations in mucosal barriers
  - Changes in cellular and humoral immunity, loss of the proliferative capacity of immune cells and decreased production of specific cytokines (increased risk for intracellular pathogens)
  - Reductions in immunoglobulin production

Common UTI Pathogens

- E. Coli (80% community UTIs)
- Klebsiella
- Enterobacter
- Proteus
- Pseudomonas
- Staph saprophyticus (5-15%)
- Enterococcus
- Candida

Normal Perineal Flora

- Lactobacillus
- Corynebacteria
- Staph aureus
- Streptococcus
- Anaerobes

Diagnosis of UTI

- Clinical symptoms: urinary frequency, urgency, dysuria (hematuria, malodorous urine, suprapubic pain)

UTIs

Uncomplicated

- Healthy adult (>11 yo)
- Not pregnant
- Normal urinary tract ("apparently")

Complicated

- Catheter
- Renal transplant
- Urologic abnormality
- Diabetes

UTIs

Lower urinary tract: cystitis:"bladder"

- Urinary frequency, urgency, dysruria

Upper urinary tract :pyelonephritis "kidney "

- Flank pain
- Fever
- May or may not have lower urinary tract symptoms

Geriatric Patient Presentation

- Clinical signs-more subtle
  - Fever is absent in 30-50% of frail older adults even in setting of serious infection
  - Nonspecific decline in baseline functional status
  - Exacerbation of underlying illness
  - Cognitive impairment may hamper typical presentation

Minimum criteria for initiation of antibiotics for UTI in long-term care residents

With catheter

- At least one of the following
  - Fever
  - New CVAT
  - Rigors
  - New onset delirium

Without catheter

- Acute dysuria OR
- Fever and at least one of the following
  - New, worse urgency
  - Frequency
  - Suprapubic pain
  - Gross hematuria
  - CVAT
  - Urinary incontinence

Urinalysis

- Dipstick
  - +LE 64-90% specific and sens for UTI
  - +nitrite (nitrate to nitrite by GNR) 50% sensitive for UTI
- Microscopic: pyuria (>10 WBC/hpf) most reliable, but much less specific

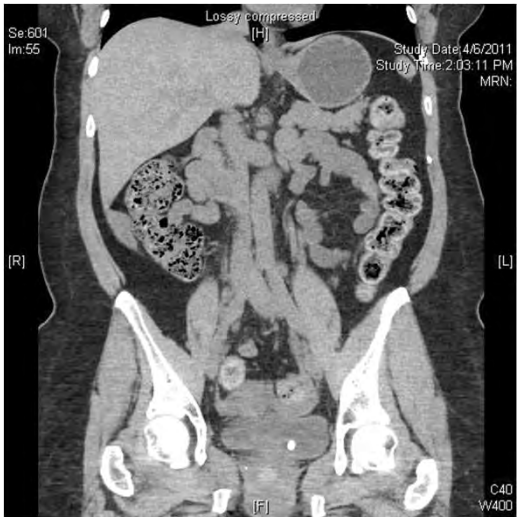
Quantitative Urine Culture

- >100,000 col/ml UTI
- > 1000 col/ml is UTI
  - symptomatic patient with pyuria

Urine cultures in infected elderly patients may have lower colony counts (100-1000) compared to 100,000 in younger patients.

Differential Diagnosis

- Herpes
- Vaginitis
- Urethritis (chlamydia, gonorrhea)
- Urinary stones (distal ureter, bladder)
- Overactive bladder
- Painful bladder syndrome
- Radiation cystitis
- Bladder cancer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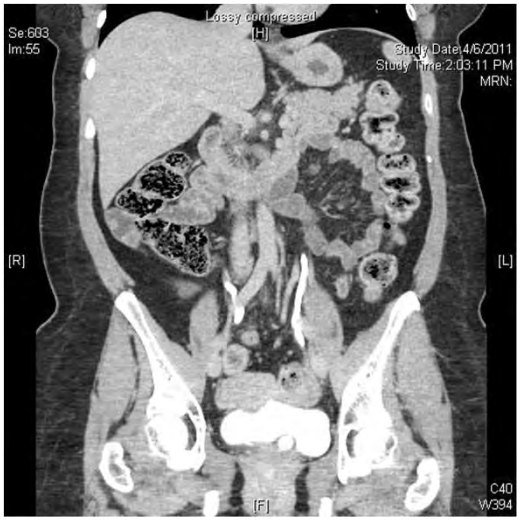
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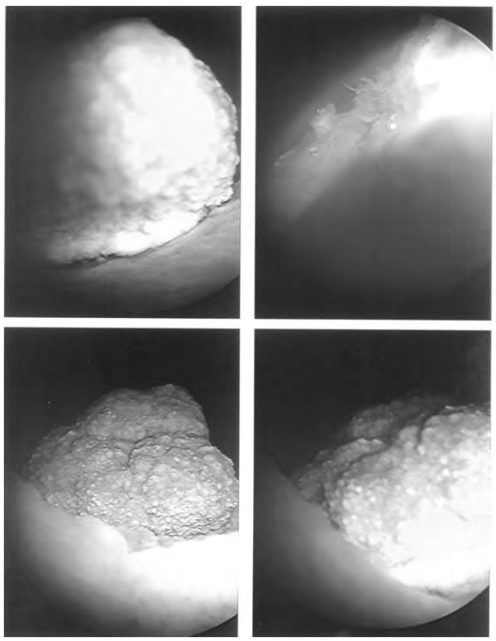

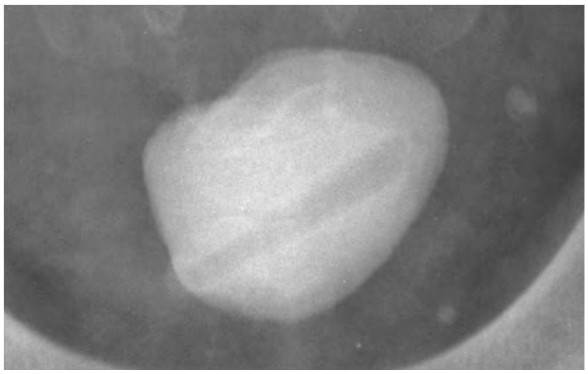

Imaging?

- Patients with flank pain and fever
- Patients with symptoms > 5days prior to treatment
- Persistent fever for >72 hrs despite treatment

- Need to r/o abscess but more importantly presence of obstruction. Obstruction and infection may lead to urosepsis and death.

Geriatric Patient Evaluation

Consider post-void residual

Management of UTIs

- Empiric treatment
  - Know bacterial resistance patterns
- Identify Pathogen
- Length of treatment (1-5, usually 3 D)
  - Host co-morbidities
  - Bladder vs. Kidney
  - Antibiotic chosen

Empiric Treatment

IDSA recommendations:

Nitrofurantoin

Fosfomycin

Geriatric UTI Management

- Systematic review comparing antibiotic course duration (1, 3-6, 7-14 days) for uncomplicated UTI in elderly women: 3-6 day courses were sufficient.
- UTIs in men generally complicated. Elderly men need longer course. 3 days of antibiotics insufficient.

Geriatric UTI Management

- Older adults in institution where multi-drug resistant organisms prevalent, consider broader initial coverage
- Mortality, length of ICU stay are improved when initial antibiotic regimen is effective against the infecting organism.
- Appropriate dosing for advanced age

UTI Prevention

- Evidence-based
  - Avoid spermicides
  - Void to completion
  - Vaginal estrogens for menopausal women
  - No/less sex
- Maybe
  - Cranberry juice/supplements
  - Probiotics
- Makes some sense, little to no data
  - Wipe front to back
  - Close the lid when flushing
  - Treat constipation

A Controlled Trial of Intravaginal estriol in postmenopausal women with recurrent UTIs
Raz. R. Stamm W. NEJM 1993

Double blind placebo controlled
Topical intravaginal estriol
Healthy 50-70 year old women
5.9 UTIs/pt year vs. 0.5 in estriol group
Lactobacilli were absent in all pretreatment cultures.
Present in 61% treated vs.
0 in controls

What form of estrogen the best?

- Small studies show some benefit with oral estrogens, others have shown none
- Topical estrogens have shown most benefit in studies

Geriatric UTI Prevention

Remove catheters. Clean intermittent catheterization is associated with fewer infections.

(Suprapubic tube infection rate =urethral foley catheter)

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