Objectives

• Learn to differentiate asymptomatic bacteriuria from UTI.
• Learn to correctly utilize urinalysis results
• Understand the evidence supporting withholding antibiotics for asymptomatic bacteriuria.
• Gain an understanding of the scope of the problem of overtreatment of asymptomatic bacteriuria.
“He seemed like an arrogant curmudgeon”
Case 1

75 yo female in the ER with DM
  • Weakness
  • SOB
  • No urinary symptoms

WBC 14000

Afebrile

UA: +LE, +nitrites, full field WBC, bacteria
Treat or Not

• UTI – Treat
• Asymptomatic bacteriuria vs. UTI – Treat
• Asymptomatic bacteriuria – Don’t treat
Don’t Treat

75 yo female in the ER with DM
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WBC 14000

Afebrile

UA:  +LE, +nitrites, full field WBC, bacteria
Definitions

- Asymptomatic bacteriuria
- Lower UTI
- Pyelonephritis
Asymptomatic Bacteriuria

• No Symptoms

• $>10^5$ bacteriuria (x2)
Lower Urinary Tract Infection

• **Symptoms**
  – dysuria
  – frequency
  – urgency
  – suprapubic pain/tenderness
  – gross hematuria

• >$10^2$ CFU bacteria

Nonspecific symptoms don’t count
Upper Urinary Tract Infection

• **Symptoms**
  - Fever
  - CVA pain and tenderness
  - Nausea/vomiting
  - **May or may not have lower UTI findings**

• > $10^2$ CFU bacteriuria
Does UA Differentiate ASB and UTI?

- Leukocyte Esterase
- Nitrite
- Pyuria
- Bacteriuria

Nicolle LE et al. 2005
What We Think We know

“Normal urine is sterile”
## Prevalence of asymptomatic bacteriuria in selected populations.

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\(^a\) Age, \(\geq70\) years.

Nicolle LE et al 2005
Define "normal"!
Asymptomatic Bacteriuria Always Treat

- Pregnancy
  - RR of pyelonephritis 0.25 with treatment of ASB vs. placebo
- Before urologic surgeries
  - Up to 60% of ASB patient will develop bacteremia with bladder manipulation
  - RCT evidence for decrease in bacteremia

Smaill F et al 2007, Nicolle LE et al 2005
Asymptomatic Bacteriuria Maybe Treat

• After removal of urinary catheter
  – Higher incidence of development of symptomatic UTI in untreated patient.
  – 2013 meta analysis of prophylaxis after removal
    • Symptomatic UTI 4.7% treated vs 10.5% not treated
      – NNT 17

• Immunocompromised patients

ASB Don’t Treat

- 2015 meta analysis of studies of abx vs placebo for ASB
  - 9 studies
  - Ambulatory, institutions, inpatient
  - No difference
    - symptomatic UTI
    - complications
    - death
  - RRR of any adverse event: 3.77

Zalmanovici, T et al 2015
Put Down the Prescription Pad and Walk Away!

- Diabetics
  - RCT with 50 placebo, 55 treatment
  - At 4 weeks, 78% placebo had bacteriuria vs 20 percent treated
  - Long term no difference
    - symptomatic UTI
    - pyelonephritis
    - hospitalization
  - 18% treated vs 6% untreated had medication adverse event

Harding et al 2002
I Really Mean It – Don’t Do It!

• Institutionalized patients
  – Patients with ASB randomized to antibiotic or placebo
  – No difference in GU morbidity
  – No UTI deaths at one year in either group
  – Side effects in 40% of treatment group
    • rashes
    • candida infections
    • diarrhea
    • swollen mouth

Nicolle LE et al 1983
• Institutionalized patients
  – 9 Year observational study obtained UA of elderly institutionalized women every 6 months
    • No difference in mortality between ASB and not
  – 5 years of the study, RCT of antibiotics vs placebo
    • No difference in mortality

Abrutyn E et al 1994
What to Say to the Orthopedist

• Before knee or hip replacement
  – Prospective cohort study
  – 2497 THA and TKA screened for ASB
  – 12.1% had ASB
  – 50% treated – individual judgment of provider
  – Overall 4.3% of ASB got joint infection vs 1.4%
  – No difference in infection risk between treated and untreated patients
  – No correlation between joint and urine organism

Sousa R et al 2014
High Risk Premenopausal Women With Recurrent UTI

• Community
  – 673 Patients with recurrent UTI screened for ASB
  – Randomized to antibiotics or placebo
  – At 12 months 13% untreated vs 47% treated got symptomatic UTI (P<.001)
  – NNH 3

Cai T et al 2012
High Risk Premenopausal Women With Recurrent UTI

• 3 year follow up study
  – 37.7% of untreated group got symptomatic UTI vs 69.6% treated group
  – E coli culture results from symptomatic UTI:

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<td>Amox/clav</td>
<td>3.8%</td>
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<td>11.5%</td>
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<td>19.2%</td>
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Cai T et al 2015
Catheter Associated UTI

• Never event in hospitals
• Financial penalties
• Overdiagnosed
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Nicolle LE et al 2005
Catheter Associated UTI

• Symptoms
  – Fever, rigors
  – Pelvic Discomfort
  – CVA pain or tenderness
  – Mental status changes
  – Malaise/lethargy

• Bacteriuria, pyuria

Hooton TM et al 2009
Why Not Treat

- 60 ICU patients with CAASB randomized to change of catheter and antibiotics or none
- 3 patients in each group developed urosepsis
- No difference in other clinical outcomes
- No difference of bacteriuria rates at 7 and 15 days.

Leone et al
What is a symptom:

- Delirium?
- Dizziness?
- Fatigue?
- Malaise?
• Urinary tract infections are a common cause of delirium in older adults.
• Not treating a delirious adult with bacteriuria leads to bad outcomes.
• Treating delirium in older adults improves delirium faster than not treating.
Delirium – What We Do Know

• Patients with delirium are more likely to have bacteriuria
• Patients with bacteriuria are more likely to be delirious.
  – 38% of hospitalized patients with bacteriuria delirious vs. 8% without bacteriuria delirious
• Delirious patients more volume depleted, incontinent, comorbid

Asymptomatic Bacteriuria Reality

• Community teaching hospital 47% of inpatient ASB treated
• VA medical center 32% CAASB treated
• Acute care teaching hospital 48% ASB and 42% CAASB treated
• Ottawa teaching hospital prospective study found 72% CAASB treated
Asymptomatic Bacteriuria Reality

- 43% of elderly women discharged from the ER with UTI had a negative culture.
- 41% of nursing home patients not meeting UTI criteria were treated with an 8.5 fold increase in C dif risk.
"I dunno, maybe deep down I want to bark up the wrong tree."
Conclusions

• Pyuria and bacteriuria are frequently a normal finding
• Treating ASB not helpful, can be harmful
• 30-70% of inpatient and institutional asymptomatic bacteriuria is inappropriately treated.
• Be judicious in the use of antibiotics in the delirious elderly patient with bacteriuria.


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