Bacteriuria/Catheter Associated UTI

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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.

Thanks for the Honesty

"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

- Weakness
- SOB
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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

  Symptoms less specific

  – 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"

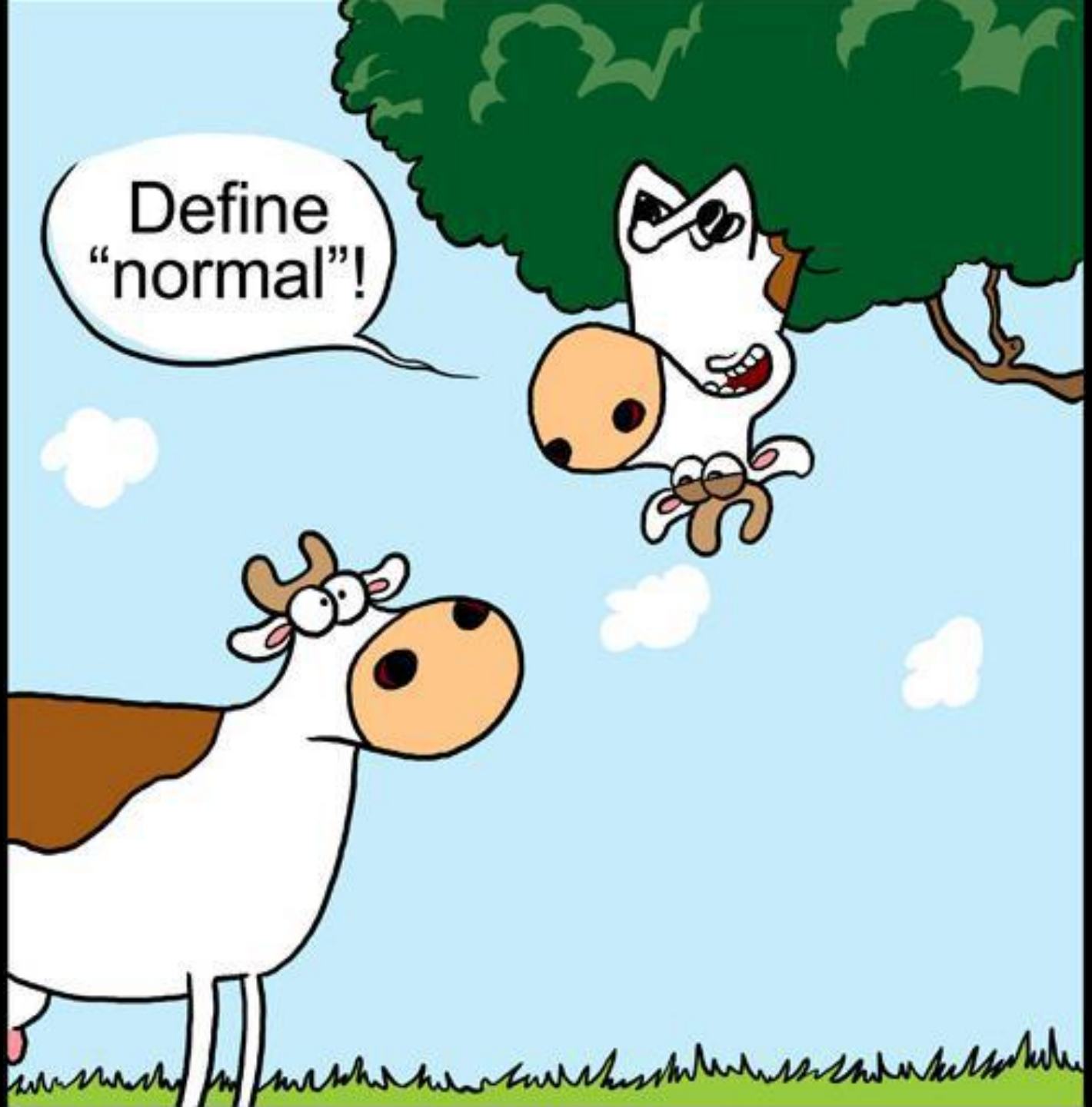
Prevalence of asymptomatic bacteriuria in selected populations.

Population	Prevalence, %	Reference
Healthy, premenopausal women	1.0–5.0	[31]
Pregnant women	1.9–9.5	[31]
Postmenopausal women aged 50–70 years	2.8–8.6	[31]
Diabetic patients		
Women	9.0–27	[32]
Men	0.7–11	[32]
Elderly persons in the community[a]		
Women	10.8–16	[31]
Men	3.6–19	[31]
Elderly persons in a long-term care facility		
Women	25–50	[27]
Men	15–40	[27]
Patients with spinal cord injuries		
Intermittent catheter use	23–89	[33]
Sphincterotomy and condom catheter in place	57	[34]
Patients undergoing hemodialysis	28	[28]
Patients with indwelling catheter use		
Short-term	9–23	[35]
Long-term	100	[22]

[a] Age, ⩾70 years.

Nicolle LE et al 2005

Clinical Infectious Diseases


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

Nicolle LE 2005 Marschall J et al 2013

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

I Really Mean It – Don't Do It!

- 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 Orthopod

- 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:

Antibiotic	Untreated resistant	Treated Resistant %
Amox/clav	3.8%	24.7%
TMP/sulfa	11.5%	34.4%
Ciprofloxacin	19.2%	44.0%

Cai T et al 2015

FIRST DO NO HARM

Catheter Associated UTI

- Never event in hospitals
- Financial penalties
- Overdiagnosed

Prevalence of asymptomatic bacteriuria in selected populations.

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Nicolle LE et al 2005

Clinical Infectious Diseases

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

Don’t Treat Asymptomatic Bacteriuria – But…

What is a symptom:

- Delirium?
- Dizziness?
- Fatigue?
- Malaise?

Delirium – What We Think We Know

- 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.

Nicolle LE et al 2009

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

Balogun SA et al 2012, Gau J et al 2009, Juthani-meta M et al 2009

EBM v Clinical Practice

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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