Positive Urine Cultures: What is their significance?

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BACKGROUND

Urinary tract infections are one of the most common type of infections seen in our hospital. A positive urine culture often results in starting an antibiotic course (1,2). The IDSA defines patients with symptomatic bacteriuria if they have fever or UTI symptoms. Urinalysis is not included in the definition. Our definitions for asymptomatic and symptomatic bacteriuria was stricter than the IDSA guidelines. This was in keeping with definitions used in clinical studies. The "other" category represents specimens that do not fit in the above two categories because these patients had another identifiable source of infection.The objectives of this study were: to determine the indications for sending urine cultures; determine if they represent asymptomatic or symptomatic bacteriuria; and to assess if antibiotics were appropriately started to treat the urine culture.

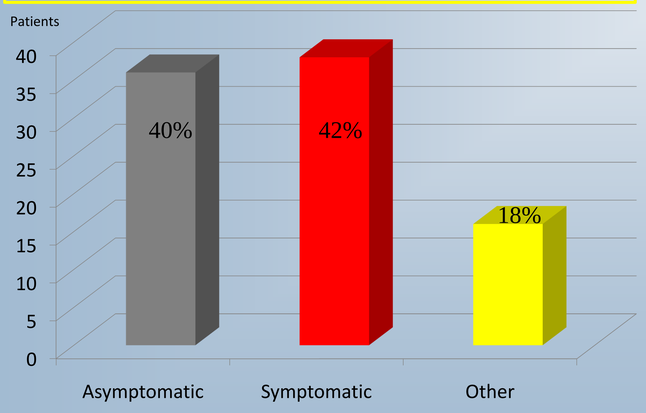
METHOD

- Retrospective chart review of all positive urine cultures done at SBH on two separate months: July 2012 and February 2013. This study was IRB approved.
- Positive urine cultures were defined as those with significant microbial growth determined by standard microbiological criteria (3,4), greater than 10^5 cfu/ml.
- Pregnant patients were excluded.

RESULTS

Different categories of bacteriuria

- **Symptomatic bacteriuria** is defined as: any patient with UTI symptoms OR a patient with fever and no other source of infection
- **Asymptomatic bacteriuria** is defined as a patient without any UTI symptoms, no fever and no evidence of an infection at another site`
- **"Other" bacteriuria** is defined as patients that do not fit the above definitions: patients without UTI symptoms but have another identifiable source of infection



Total of 90 urine samples were positive for bacteria.

- 79 were voided specimens and 11 (12%) from indwelling Foleys

Patient characteristics for asymptomatic and symptomatic bacteriuria:

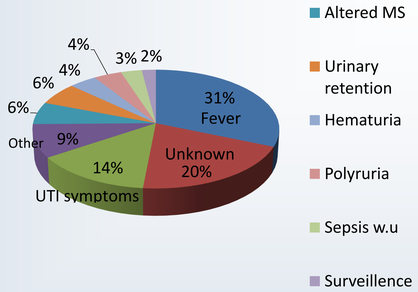
•The two groups are similar except for diabetic patients. More diabetic patients had asymptomatic bacteriuria compared to patients who had symptomatic bacteriuria (*p=0.01).

	Asymptomatic	Symptomatic	Other
N	36	38	16
Male	28%	42%	56%
Avg Age	66 years	61 years	58 years
NH	28%	29%	0
Foley	4%	10%	19%
Diabetic	64%*	29%*	37%
Altered MS	17%	34%	25%

Indications for obtaining an urine culture

•See pie diagram below

•Of note, after review of the entire medical records if no indication for obtaining a urine culture was found, then it was classified as unknown. 13/18 patients in the "unknown" category had asymptomatic bacteriuria (11/13 were diabetic), 0/18 had symptomatic bacteriuria, and 5/18 were in the other category (see table below).



# patients	Asymptomatic	Symptomatic
UTI sx/fever/ Sepsis w.u	0	34
Unknown	13	0
Other	6	1
Polyuria	3	1
Urinary retention	5	0

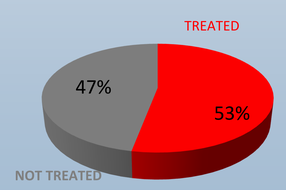
Indications for urine culture for asymptomatic and symptomatic patients

Value of Urinalysis in patients with bacteriuria

•The number of WBC/HPF was not different in patients who were classified as symptomatic or asymptomatic. This held true even for patients with or without Foleys.

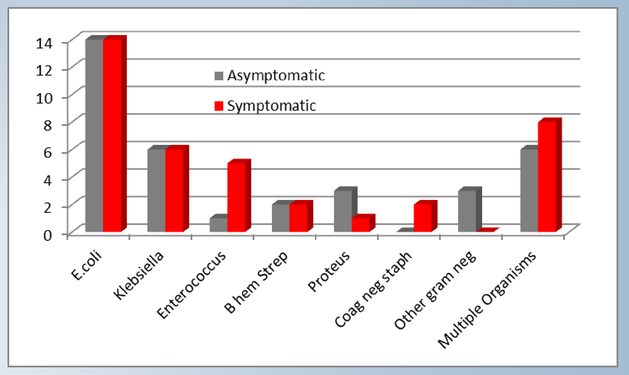
Avg WBC in urine	Asymptomatic	Symptomatic	Other
All specimens	52 wbc/hpf	71 wbc/hpf	52 wbc/hpf
Clean catch	39 wbc/hpf	35 wbc/hpf	45 wbc/hpf

How often were antibiotics started in patients with asymptomatic bacteriuria?



Asymptomatic Bacteriuria

Bacteria isolated from Urine Cultures



DISCUSSION

- 42% of patients with bacteriuria were classified as symptomatic and should be treated (79% were treated in this study)
- 40% of patients with bacteriuria were classified as asymptomatic, and should not be treated. In this study 53% of these patients were treated inappropriately.
- The most common reason given for sending urine culture was fever (31%). The second was an "unknown" reason (20%).
- The presence of WBC on urinalysis did not distinguish between asymptomatic or symptomatic UTI.
- Patients with diabetes had a statistically significant higher rate of asymptomatic bacteriuria. This is consistent with the literature that describes three to fourfold higher rates of bacteriuria in diabetic patients.
- The most common organism isolated was *E. coli*. There was no organism preponderance in patients with symptomatic or asymptomatic bacteriuria.

CONCLUSION

➢Patients with asymptomatic bacteriuria should not have urine cultures sent. This could have decreased urine cultures by 40%.

➢53% of patients with asymptomatic bacteriuria were treated inappropriately with antibiotics.

➢Urinalysis does not distinguish between asymptomatic and symptomatic bacteriuria.

➢Diabetic patients have a higher rate of asymptomatic bacteriuria than the general population.

LEARNING POINTS

➢In order to decrease cost, inappropriate antibiotic use, antibiotic resistance and side effect, urine cultures should only be sent in patients who have clear cut indications like fever or UTI symptoms. This study finds that 20% of urine cultures were sent without any identifiable reason and *all* of these cultures did not represent symptomatic bacteriuria.

➢Asymptomatic bacteriuria should not be treated.

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