

Urinary Tract Infection in Women Visiting Rural Primary Care Practices

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In order to estimate the proportion of women who have urinary tract infection, 23 rural primary care private practices agreed to obtain information according to a standard protocol on women over 12 years of age with urinary tract symptoms. Women excluded were those with vaginitis, chronic urinary tract infection, or concurrent confounding diagnoses.

The results of the study on 213 women showed that the proportion of ambulatory women with urinary symptoms diagnosed as having urinary tract infection ranged from 31 percent to 71 percent, depending on the diagnostic criteria used. The type of urinary symptoms experienced by the women were not sensitive for cultures of 10^5 or more organisms per milliliter.

Primary care clinicians evaluating women with urinary tract symptoms have several diagnostic criteria for urinary tract infection from which to choose. In order to estimate the proportion of women who have a urinary tract infection, 213 women over 12 years of age with urinary symptoms visiting primary care practices were asked questions and had urine cultures obtained according to a standard protocol. Depending on the diagnostic criteria used, the proportion of ambulatory women with urinary symptoms diagnosed as having a urinary tract infection ranged from 31 percent to 71 percent.

Methods

Twenty-three rural primary care private practices agreed to obtain the following information on women over 12 years of age with urinary tract symptoms:^{1,2} age, duration in days, number of documented infections in the previous year, frequency, internal dysuria, external dysuria or vaginal irritation, sexual intercourse within 24 hours of symptoms, and dipslide urine culture. Women excluded were those with vaginitis, chronic urinary tract infection, or other concurrent confounding conditions (eg, pregnancy, diabetes mellitus, paraplegia). All participating clinicians viewed a standard presentation of the study design and methods at the beginning of the study. The study was to terminate when 300 patients were entered or in six months, whichever came first. The study was terminated at six months.

Audit of the billing diagnosis for one month during the study revealed that 136 women were given

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Table 1. Five Diagnostic Criteria for Urinary Tract Infection in Ambulatory Female Patients

Criteria*	Percent of Women Who Fulfilled Criteria**	Percent of Women Having $\geq 10^5$ organisms/mL	Percent of Women Prescribed Antibiotics†
A. $\geq 10^5$ organisms/mL and ≥ 8 WBC/HPF	31 (52/167)	100 (52/52)‡	94 (48/51)
B. $\geq 10^5$ organisms/mL	40 (85/213)	100 (85/85)‡	94 (49/84)
C. $\geq 10^5$ organisms/mL or ≥ 8 WBC/HPF with pure growth 10^3 - 10^5 mL	55 (91/167)	75 (68/91)	92 (83/90)
D. Internal dysuria and frequency	59 (126/213)	40 (50/126)	86 (107/125)
E. Pyuria (≥ 8 WBC/HPF) and any symptoms	71 (118/167)	46 (52/118)	90 (105/117)

*Refer to Methods
**Statistically significant differences ($P < .05$) were observed between criterion C and criteria A, B and E
Criteria D and E were also significantly different ($P < .05$)
†No statistically significant differences were present
‡By definition

the diagnosis of urinary tract infection or cystitis and met the age entry criteria. Sixty-eight (48 percent) of these women were entered into the study. An audit of 35 randomly selected medical records of women not entered into the study revealed that 71 percent (25/35) were excluded according to the study protocol. The women who were excluded without protocol justification were older than those who were entered into the study; 80 percent (8/10) were over 45 years of age.

Of the 275 patients entered into the study, 59 subsequently were eliminated: 36 had no symptoms recorded by the clinician, 14 had no index (first) culture obtained, and 9 had vaginitis.

Duplicate clean-void Uricult dipslide cultures were obtained on all women at the index (first) visit. One culture was read at the office; the other was mailed to the medical center for reading in a reference laboratory. Although not specified as part of the study protocol, clean-voided midstream urinalyses were obtained on 78 percent (167/213) and traditional pour plate urine cultures were performed on 31 percent (67/213) of the women at the index visit. Two months after this index visit, the

medical records of all women were reviewed to obtain the physical findings recorded, office laboratory results, subsequent visits, and treatments received by the women.

The criteria for the diagnosis of urinary tract infection shown in Table 1 were arrived at as follows. Criteria A and B were derived from definitions stated by Kunin³ or were drawn from those in common use by practicing clinicians. Criterion C was extrapolated from the abnormal chamber count findings of Stamm et al.⁴ to the findings of urine sediment. Chamber counts appear to be in close agreement (84 percent) to the sediment count.⁵ Criterion D was stated by Komaroff et al.⁶ Criterion E was considered valuable by many of the participating clinicians.

Results

Thirty-four percent of the women were aged 12 to 25 years, 32 percent were aged 26 to 45 years,

and 34 percent were over 45 years old. Symptom duration was three days or less for 56 percent of the women. A history of urinary tract infection during the previous year was obtained from 44 percent of the women. Frequency (87 percent) or internal dysuria (68 percent) were present in most women. External dysuria (47 percent) or a history of sexual intercourse within 24 hours of onset of symptoms (28 percent) was less frequently claimed. Temperature elevation (8 percent) and flank tenderness (17 percent) were infrequently recorded. Nine percent (19/213) of the dipslide cultures read at the reference laboratory had less than 10^3 organisms/mL, and 40 percent (85/213) had pure gram-negative bacterial growth of 10^5 organisms/mL or greater. Ten percent (21/213) of the isolated organisms were pure gram-positive, and 22 percent (46/213) of the cultures were mixed. Dipslide cultures with a reading of greater than 10^5 or less than 10^3 pure organisms/mL either at the medical center or the office corresponded well (96 percent, 46/48) to simultaneous pour plate cultures performed in the community hospital laboratories. However, the correspondence of dipslide cultures reading greater than 10^3 to less than 10^5 single organisms/mL with simultaneous pour plate cultures was only 42 percent (8/19).

Table 1 indicates that diagnostic criterion A was most restrictive and criterion E was the least. Antibiotics were prescribed to 82 percent of all women and showed no significant variation in women with urinary tract infection diagnosed by the five listed criteria. No single symptom or combination of symptoms were more than 60 percent sensitive for 10^5 or more organisms/mL isolated by either the dipslide or pour plate culture technique.

Discussion

Of ambulatory women with urinary tract symptoms visiting rural practices, 31 to 71 percent had urinary tract infection depending on the diagnostic criteria selected. The observation that most symptomatic women were prescribed antibiotics may be testimony to the variability of the diagnostic criteria for urinary tract infection.

This study was unable to confirm that the combination of internal dysuria and frequency in the absence of vaginitis would be over 75 percent sensitive for more than 10^5 organisms/mL.⁶ This study did confirm the reliability of a dipslide culture method when more than 10^5 or less than 10^3 organisms/mL were isolated.⁷ Results between 10^3 to 10^5 organisms/mL did not correspond well to the traditional pour plate culture simultaneously performed at the office. Dipslide cultures producing 10^3 to 10^5 organisms/mL may need to be repeated or corroborated with a pour plate culture.

Recently, treatment of women with pyuria and low colony counts (less than 10^5 /mL) has resulted in significant reductions of pyuria, symptoms, and microorganisms.⁸ These published findings suggest that criterion C may be a reasonable alternative for the diagnosis of urinary tract infection in ambulatory female patients. Nevertheless, the optimum operational diagnostic criteria for urinary tract infection in ambulatory women has yet to be defined.

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