

Rate of mixed urogenital flora with different methods of urine specimen collection

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Problem

- Many urogynecology and urology clinics collect urine specimens as midstream urine (MSU) samples for the evaluation of urinary symptoms
- A recent study reported 46% of MSU samples collected in an academic urology practice were mixed flora indicating contamination, and the prevalence was higher in women with advanced age regardless of additional patient education about specimen collection
- It is essential to mitigate contamination risk

Goal

- Evaluate the rate of mixed flora results in urine specimens obtained by MSU compared to straight catheter urine (SCU)
- Determine if there are patient differences in urine cultures results reported as mixed flora compared to negative or positive cultures

Strategy

- We performed a quality improvement project evaluating urine culture results of women who provided either a MSU or SCU sample for analysis
- Adult women seen within urogynecology clinics at University of Chicago between 4-8/2023 who had a urine culture performed for any indication were included
- Faculty were encouraged to obtain SCU samples as part of this QI initiative
- Patient demographics and urine specimen information were collected via chart review
- Mixed flora was defined as the presence of ≥ 2 non-uropathogens or 1 uropathogen in low quantity
- Positive urine cultures were defined as $\geq 10^3$ colony forming units (CFU)/mL of a single isolated uropathogen
- Negative urine cultures were defined as no growth after 48 hours
- Standard group comparisons were performed

Women seen within urogynecology clinics between April to August 2023

Faculty encouraged to obtain SCU samples

Compared urine culture results

- Mixed flora
- Positive culture
- Negative culture

Results

Variable	Entire Cohort (n=97)	Positive/Negative Culture (n=86)	Mixed Flora Culture (n=11)	p
Age; years	66.6 (± 13.7)	66.7 (± 13.8)	72.1 (± 2.2)	0.08
BMI; kg/m ²	27.7 (± 7.2)	27.9 (± 7.5)	26.9 (± 7.5)	0.43
Government Insurance	62 (63.9%)	52 (60.4%)	10 (90.9%)	0.04
Postmenopausal	86 (88.7%)	75 (87.2%)	11 (100%)	0.21
Never smoker	72 (74.2%)	64 (74.4%)	8 (72.7%)	0.48
Currently sexually active	8 (8.2%)	7 (8.1%)	1 (9.1%)	0.85
Medical co-morbidities				
Diabetes mellitus	12 (12.4%)	11 (12.8%)	1 (9.1%)	0.73
Hypertension	48 (49.5%)	43 (50.0%)	5 (45.5%)	0.77
History breast/GYN cancer	8 (8.2%)	7 (8.1%)	1 (9.1%)	0.91
History stroke	2 (2.1%)	2 (2.3%)	0 (0%)	0.61
Obstructive sleep apnea	3 (3.1%)	3 (3.5%)	5 (45.5%)	0.53
Surgical history				
Hysterectomy	40 (41.2%)	33 (38.4%)	7 (63.6%)	0.11
Prolapse surgery	11 (11.3%)	9 (10.5%)	2 (18.1%)	0.45
Incontinence surgery	14 (14.4%)	13 (15.1%)	1 (9.1%)	0.59
Other genitourinary surgery	8 (8.2%)	7 (8.1%)	1 (9.1%)	0.91
Current vaginal estrogen use	27 (27.8%)	23 (26.7%)	4 (36.4%)	0.50
Urine specimen collection				0.02
SCU	50 (51.5%)	48 (55.8%)	2 (18.2%)	
MSU	47 (48.5%)	38 (44.2%)	9 (81.8%)	
Indication				0.07
Initial evaluation	49 (50.5%)	46 (53.5%)	3 (27.3%)	
Urinary tract infection symptoms	27 (27.8%)	23 (26.7%)	4 (36.4%)	
Pre-procedure	5 (5.2%)	5 (5.8%)	0 (0%)	
Abnormal point of care urinalysis	12 (12.4%)	8 (9.3%)	4 (36.4%)	
Other	4 (4.1%)	4 (4.7%)	0 (0%)	

- 97 women provided a urine specimen during the study period
- SCU collection was performed for 50 women while 47 provided a MSU sample
- Mean age and body mass index (BMI) were 66 years old and 28 kg/m² respectively
- Majority of women had government insurance, were postmenopausal, and never smoked tobacco
- 11.3% of urine cultures were reported as mixed flora (19% in MSU and 4% in SCU, p=0.45)
- Mixed flora was more common in MSU specimen (82%, p=0.01) and in patients with government insurance (91%, p=0.04) compared to positive or negative cultures
- Patient demographics were otherwise similar between groups

Conclusion

- Nearly 20% of urine culture results from women who provided MSU specimens were mixed flora
- The prevalence of mixed flora was reduced significantly when SCU samples were obtained
- Clinicians should consider performing SCU collection when urine specimen is required for patient evaluation as contamination can cause significant burden for both the patient and provider

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