

## DETECTING UROPATHOGENS IN A UROGYNECOLOGIC POPULATION: A COMPARISON OF UTI DIAGNOSTIC THRESHOLDS

### Hypothesis / aims of study

In urogynecologic patients who report they have a UTI, we compared the proportion of patients with at least one uropathogen detected using 4 different diagnostic thresholds. We also assessed the symptoms resolution after clinically directed treatment.

### Study design, materials and methods

We prospectively enrolled 75 urogynecologic patients who reported they had a UTI (yes response to “Do you feel you have a UTI?”). Catheterized urine samples were assessed with standard urine culture (SC) thresholds and an enhanced quantitative urine culture (EQUC) protocol that uses a larger urine volume than SC incubated under diverse combinations of media and environmental conditions. Four diagnostic thresholds for uropathogen detection were compared:  $\geq 10^5$ ,  $\geq 10^4$  and  $\geq 10^3$  CFU/ml by SC and the presence of **any** uropathogen detected by EQUC. Clinical treatment was directed by the patient’s physician using SC results with the  $>10^5$  CFU/ml threshold. Post-treatment, patients were asked to self-complete the validated UTI Symptom Assessment (UTISA) questionnaire. Symptom resolution was determined by the answer to the question, “Since you last completed this questionnaire, have there been any changes in your urinary tract infection symptoms?”

### Results

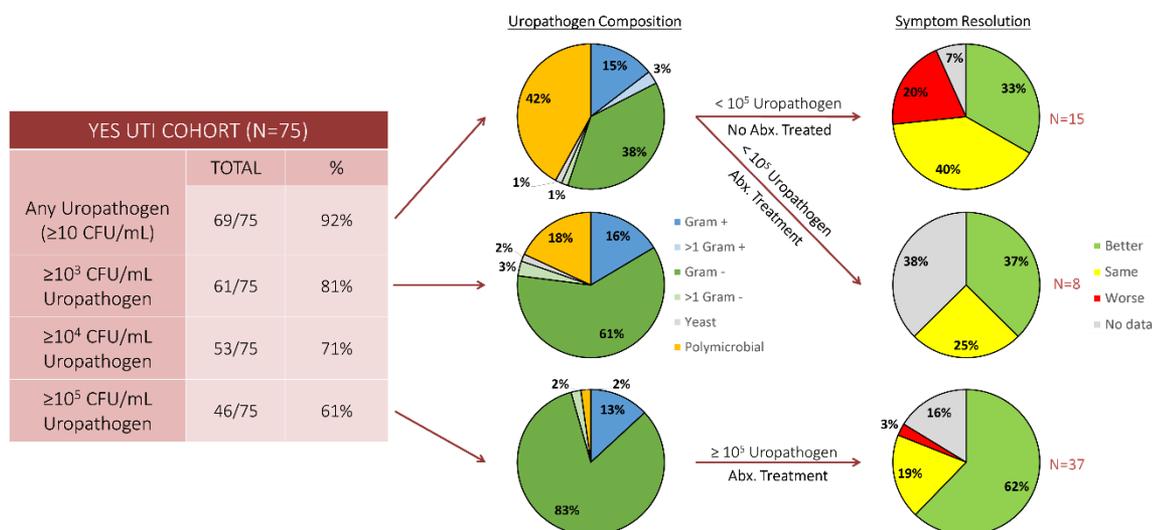
The majority of the patients were Caucasian (62/75, 83%) and overweight (mean body mass index [BMI] = 29.9 kg/m<sup>2</sup>). EQUC detected 23 known and emerging uropathogens present in nearly all patients 92% (69/75). The proportion of patients with at least one uropathogen detected declined as the diagnostic threshold increased ( $\geq 10^3$  = 81%,  $\geq 10^4$  = 71% and  $\geq 10^5$  = 61%) (Fig. 1). The effect of the diagnostic threshold was related to the characteristics of the uropathogens present. At  $\geq 10^5$  CFU/mL, most (85%) patients with detected uropathogens had Gram-negative bacteria. In contrast, when the “any” detection threshold was used, only 38% had Gram-negative uropathogens; the other 62% had polymicrobial or Gram-positive uropathogens. Many (23/37, 62%) treated patients reported symptom resolution within one week. Conversely, many (60%) untreated patients with at least one uropathogen present below the  $\geq 10^5$  CFU/mL reported that their UTI symptoms persisted (‘same’ or ‘worse’) one week later.

### Interpretation of results

In urogynecologic patients who self-report UTI, uropathogens are commonly present. These data support a diagnostic threshold less than the commonly used  $\geq 10^5$  CFU/mL. Patients with polymicrobial or Gram-positive infections are less likely to be diagnosed with UTI and less likely to be treated for these uropathogens.

### Concluding message

The current diagnostic methods used for UTI are ineffective in a urogynecologic population.



**FIGURE 1. Schematic of Uropathogen Detection.** (left) Depicts the uropathogen detection in the YES UTI cohort using various CFU/mL thresholds. (middle) Depicts the composition of the uropathogens detected at each threshold by Gram stain. Presence of one or more Gram + and Gram - is defined as ‘polymicrobial’. (right) Depicts the symptom resolution indicated by the patient. Antibiotic (Abx) treatment is indicated.

### Disclosures

**Funding:** R21 DK097435 **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Loyola University Chicago Institutional Review Board (IRB) **Helsinki:** Yes **Informed Consent:** Yes