Misinterpretation of Midstream Urine Culture Results Leads to Inappropriate Treatment of UTI

December 04, 2013
By Sarah Bruyn Jones [1]

The value of a midstream urine culture in the treatment of patients with symptoms of acute uncomplicated lower urinary tract infection is once again being questioned.

The study, led by Thomas M. Hooton, MD, professor of medicine and Clinical Director of the Division of Infectious Diseases, set out to more accurately determine the diagnostic value of voided midstream urine cultures by evaluating 202 episodes of possible urinary tract infection in 226 women aged 18 to 49 years.

While midstream urine cultures in healthy premenopausal women with acute uncomplicated cystitis accurately showed evidence of bladder \textit{Escherichia coli}, they did not show enterococci or group B streptococci, both of which are often isolated with \textit{E. coli} but appear to rarely cause cystitis by themselves, the researchers concluded.

In almost all the episodes analyzed, the researchers found patients had two or more symptoms that are classically associated with acute cystitis and none had features of upper urinary tract disease or other complicating factors. The study design used quantitative cultures of matched specimens of midstream urine and bladder urine, which was obtained through a urethral catheter.

The researchers found that cultures were positive for uropathogens in 70\% of catheter specimens and 78\% of midstream specimens.

The presence of \textit{E. coli} in midstream urine was highly predictive of bladder bacteriuria even at very low counts. In contrast, in midstream urine, enterococci (in 10\% of cultures) and group B streptococci (in 12\% of cultures) were not predictive of bladder bacteriuria at any colony count (Spearman's \(r=0.322\) for enterococci and 0.272 for group B streptococci). Among 41 episodes in which enterococci, group B streptococci, or both were found in midstream urine, \textit{E. coli} grew from catheter urine cultures in 61\%.

“Several aspects of the current study in the context of clinical practice may further erode the potential utility of the midstream urine culture,” wrote Michael S. Donnenberg, MD, in an editorial accompanying the study. “In most clinical laboratories, midstream urine specimens that have a low concentration of \textit{E. coli} or \textit{E. coli} in conjunction with other bacteria are reported as negative or contaminated, yet they may represent false negative tests. Conversely, midstream urine cultures from which moderate or high concentrations of enterococci or group B streptococci are isolated probably represent false positive tests for cystitis. If the midstream urine culture is to remain useful for the diagnosis of uncomplicated cystitis, it may need to be refined.”

The authors suggested that this study, which was funded by the National Institute of Diabetes and Digestive and Kidney Diseases, shows that misinterpretation of midstream urine cultures may result in the undertreatment of low-quantity or mixed \textit{E. coli} infections. In addition, they indicated concern that midstream urine cultures could be leading to inappropriate treatment in instances where enterococcus or group B streptococcus is reported by the laboratory.

“If treatment of suspected cystitis is to be delayed pending the results of midstream urine culture, one should consider asking the laboratory to quantify \textit{E. coli} to \(10^2\) CFU [colony-forming units] per milliliter to improve sensitivity,” the study suggested.

\textbf{Pertinent Points:}

- The use of midstream urine cultures in the treatment of premenopausal women with symptoms of acute uncomplicated lower urinary tract infection may lead to undertreatment or inappropriate treatment.
- Midstream urine cultures accurately showed evidence of bladder \textit{E. coli} but did not show enterococci or group B streptococci.
Reference

References:

Source URL:
http://www.physicianspractice.com/urogynecology/misinterpretation-midstream-urine-culture-results-leads-inappropriate-treatment-uti

Links: