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INFECTION

Utility of midstream urine cultures questioned

Voided midstream urine culture can accurately identify bladder infections caused by *Escherichia coli* but not enterococci or group B streptococci species, according to new research published in the *New England Journal of Medicine*. This lack of association between the findings of midstream urine cultures and bacterial growth in the bladder challenges the utility of this commonly used diagnostic test.

A team of researchers led by Thomas Hooton analysed microbial species and colony counts in urine samples from 226 women (aged 18–49 years) with symptoms of cystitis. "We compared the findings in voided urine—which is what clinicians order when they get a urine culture—with findings in catheter urine, which is more reflective of what is in the bladder and, therefore, the cause of the UTI," explains Hooton.

Detection of *E. coli* in voided midstream urine—at colony counts as low as $10–10^2$ cfu/ml—was highly predictive of its presence in the bladder (positive predictive values of 93% for growth of $\geq 10^2$ cfu/ml and 99% for $\geq 10^4$ cfu/ml). "The Stamm paper published in 1982 showed almost identical results," says Hooton. "But few people appear to know this, or use this in practice."

No similar data existed for other organisms, so Hooton and colleagues extended their study to enterococci and group B streptococci. These species were frequently isolated from voided urine, but rarely isolated from paired catheter specimens, leading to very low positive predictive values (10% for enterococcus colony counts of $\geq 10^2$ cfu/ml and 33% for $\geq 10^4$ cfu/ml; 8% for group B streptococci counts of $\geq 10^2$ cfu/ml and 14% for $\geq 10^4$ cfu/ml). This lack of association between voided and bladder urine suggests that these organisms rarely cause acute uncomplicated cystitis. Indeed, the researchers found that *E. coli* often grew from the same voided urine specimens as enterococci and group B streptococci and is the likely cause for UTI symptoms in such episodes. "*E. coli* in voided urine, even when grown along with other mixed flora, should not be considered a contaminant," urges Hooton. "Labs will often report such cultures—especially if the colony counts are low—as contaminated and not process them further. This practice does not serve the need of the patient or the clinician."

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Despite doubts as to the usefulness of midstream urine cultures, millions are still performed annually. Hooton and his team hope that their findings will reinforce the view that voided urine cultures are generally not indicated in the management of healthy premenopausal women with presumptive acute uncomplicated cystitis. "However, for those episodes where it is decided that a voided urine culture might be helpful to the clinician, the results of this study provide instructive information as to how the results should be interpreted," concludes Hooton. "We hope this message is heard."

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Original article Hooton, T. M. *et al.* Voided midstream urine culture and acute cystitis in premenopausal women. *N. Engl. J. Med.* doi:10.1056/NEJMoa1302186