Performance of urinalysis tests in screening for significant bacteriuria among human immunodeficiency virus-infected subjects in South India

Sir,

While opportunistic infections in human immunodeficiency virus (HIV) infected individuals are extensively studied, very limited data are available on urinary tract infections (UTIs) in HIV patients.[1] We evaluated the usefulness of rapid urine dipstick tests and microscopy for detecting bacteriuria against urine culture in HIV setting and investigated if these rapid screening tests could replace urine culture, thereby, reducing the costs and time for laboratory diagnosis.

A total of 550 HIV-infected individuals presenting with symptoms of UTI from January 2011 to December 2014, were included. Since the data were retrospectively analyzed from laboratory records, we did not seek any IRB approval. Moreover, this study does not link any patient identification details in the analysis or elsewhere. Each subject had submitted a fresh, random mid-stream urine specimen. A dipstick-based urinalysis (Multiple® Reagent Strips for Urinalysis, Siemens, NY, USA) was immediately performed to detect leukocyte esterase (LE) and nitrite (NIT). Microscopy for pyuria was also performed on centrifuged urine specimens. Semiquantitative urine culture was performed, and the significant bacterial isolates were identified by standard procedures.[2] Urinalysis results were correlated with results of urine cultures and performance characteristics of urinalysis tests were evaluated.

Of the study population, 57.6% were females with mean age of 30.3 years (range, 4–66) and the rest were males with mean age of 38.6 years (range, 1–79). Most infections were due to *Escherichia coli* (10.7%), followed by other members of family *Enterobacteriaceae*, *Staphylococcus aureus* and *Pseudomonas aeruginosa.* Table 1 outlines the performance of the urinalysis tests for detection of significant bacteriuria. A positive urinalysis result (combining the LE, NIT and excluding microscopy) had a sensitivity of 57.4% and a specificity of 99.7%. On further analysis by including only the Gram-positive uropathogens, the LE's sensitivity and specificity dropped to about 72.2% and 68.5%, respectively. However, sensitivity and specificity of NIT including only the *Enterobacteriaceae* members modestly raised to 36.7% and 99.5%, respectively.

The results of the present study expand the previous findings in other non-HIV study populations that the performance of the rapid screening dipstick urinalysis tests as compared with the culture results is relatively poor.[3-5] Although these rapid tests allow HIV-infected individuals to be screened and treated in the same visit, the decreased sensitivity of dipstick tests in detecting significant bacteriuria limits the diagnostic utility in HIV clinical care settings. Albeit being 3-fold more expensive and requiring multiple visits to clinic, the urine culture results with antibiogram ensure targeted therapy thereby eliminating the risks of indiscriminate antibiotics usage. Hence, the results of rapid dipstick urinalysis tests might not be sufficient enough to replace the conventional urine culture method, and the clinical decision is to be made only based on the culture and sensitivity results among the HIV-infected patients.

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Conflicts of interest

There are no conflicts of interest.

Table 1: Performance of the leukocyte esterase, nitrite and microscopy urinalysis tests in screening for significant bacteriuria among human immunodeficiency virus infected subjects

Screening test	Sensitivity (%)	Specificity (%)	Positive predictive value (%)	Negative predictive value (%)
LE	77.5	68.5	35.9	93
NIT	30.4	99.6	93.9	86.3
Microscopy for pyuria (>5 pus/HPF)	52.5	92.2	60.2	89.6
LE + NIT	57.4	99.7	96.9	93
LE + NIT + microscopy	53.3	99.7	96	93.5

LE=Leukocyte esterase; NIT=Nitrite; HPF=High-power field

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