

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.

Acknowledgments

The authors are grateful to the study participants and the staff at YRG CARE for the support.

Financial support and sponsorship

Nil.

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

**Ramachandran Vignesh^{1,2},
Chinnambedu R Swathirajan¹, Sunil S Solomon^{1,3,4},
Suniti Solomon¹, Pachamuthu Balakrishnan¹**

¹Infectious Diseases Laboratory, Y.R. Gaitonde Centre for AIDS Research and Education, Chennai, Tamil Nadu, India,

²Laboratory-based Department, Universiti Kuala Lumpur Royal College of Medicine Perak, Ipoh, Malaysia, ³Medical Centre, Y.R. Gaitonde

Centre for AIDS Research and Education, Chennai, Tamilnadu, India,

⁴Department of Infectious Diseases, Johns Hopkins School of Medicine, Baltimore, MD, USA

Address for correspondence: Dr. Pachamuthu Balakrishnan, Infectious Diseases Laboratory, Y.R. Gaitonde Centre for AIDS Research and Education, 2nd Floor, Admin Building, VHS Hospital Campus, Rajiv Gandhi Salai, Taramani, Chennai - 600 113, Tamil Nadu, India.
E-mail: bala@yrgcare.org

REFERENCES

1. Vignesh R, Shankar EM, Murugavel KG, Kumarasamy N, Sekar R, Irene P, *et al.* Urinary infections due to multi-drug-resistant *Escherichia coli* among persons with HIV disease at a tertiary AIDS care centre in South India. *Nephron Clin Pract* 2008;110:c55-7.
2. Myer's and Koshi's Manual of Diagnostic Procedures in Medical Microbiology and Immunology/Serology. Faculty of Department of Clinical Microbiology, Christian Medical College and Hospital, Vellore, India. Kennedy Nagar, Pondicherry, India: All India Press; 2001. p. 31-7.
3. Nys S, van Merode T, Bartelds AI, Stobberingh EE. Urinary tract infections in general practice patients: Diagnostic tests versus bacteriological culture. *J Antimicrob Chemother* 2006;57:955-8.

4. Taneja N, Chatterjee SS, Singh M, Sivapriya S, Sharma M, Sharma SK. Validity of quantitative unspun urine microscopy, dipstick test leucocyte esterase and nitrite tests in rapidly diagnosing urinary tract infections. *J Assoc Physicians India* 2010;58:485-7.
5. Mambatta AK, Jayarajan J, Rashme VL, Harini S, Menon S, Kuppusamy J. Reliability of dipstick assay in predicting urinary tract infection. *J Family Med Prim Care* 2015;4:265-8.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

Access this article online

Quick Response Code:



Website:

www.jmsjournal.net

DOI:

10.4103/jrms.JRMS_567_16

How to cite this article: Vignesh R, Swathirajan CR, Solomon SS, Solomon S, Balakrishnan P. Performance of urinalysis tests in screening for significant bacteriuria among human immunodeficiency virus-infected subjects in South India. *J Res Med Sci* 2017;22:77.

© 2017 Journal of Research in Medical Sciences | Published by Wolters Kluwer - Medknow