Microscopy, culture, and sensitive management of uncomplicated urinary tract infections in adults in the primary care setting

To the Editor

We compliment Drs. Sivathasan and Rokowski[1] for their review on management of urinary tract infections in adults in primary care setting.

The laboratory diagnosis of urinary tract infections based on reagent strips or bacterial culture could be universally hazy in patients with concurrent presence of antibacterial substances in urine. In areas where antimicrobials are sold on the counter without any prescriptions, several adults presenting themselves at primary care setting,[1] might have already received one or more antimicrobial. We feel it would be better to screen urine samples for culture for the presence of any antimicrobials to ensure a judicious therapeutic intervention.

Recently, the investigators at the Hamad Medical Corporation, Doha, Qatar carried out antibiotic screening of 1,680 urine samples (employing *Escherichia coli* [*E. coli*] ATCC 25922 and *Staphylococcus aureus* [*S. aureus*] ATCC 25923) that were being processed for culture. There were 2494 culture-positive urine samples that included 388 samples with antibacterial substances. Among such samples there were 345 sterile samples, 32 with an insignificant growth samples, and 11 with mixed growth.[2]

Screening for antibacterial substances should not be an insurmountable task in individual health care centers where facilities for bacterial culture were available. Antibacterial substances screening on urine samples was feasible even more than 4 decades ago at the All India Institute of Medical Sciences, New Delhi, India,[3] where screening of 426 samples of urine was carried out by employing the standard Oxford strain of *S. aureus*. There was a demonstrable antibacterial activity in 127 samples, accompanied by bacterial growth in 63 samples. Isolates included *E. coli* (28 isolates), *Klebsiella species* (13 isolates), *Pseudomonas aeruginosa* (10 isolates), *Proteus species* (6 isolates), *S. aureus* (3 isolates), *Alkaligenes faecalis* (2 isolates), and *Streptococcus faecalis* (1 isolate). A history of prior antibiotic usage could be obtained in 25 cases only, although there was no relevant information in the laboratory requisition slips. In 7 cases, it was also possible to identify the antibiotics being used by the patients. The isolates in the urine samples were resistant in vitro to the prescribed antibiotics. Even with an adequate amount of antibiotic in urine, it was of little benefit to the individual.

To conclude, bacterial cultures of urine samples from patients with suspected episodes of urinary tract infection when accompanied by a concurrent screening for antibacterial substances would be cost effective, and ensure appropriate and rational therapeutic intervention in adults in primary care settings.[1]

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Reply from the Author

When choosing a test in the 'real world', all clinicians should consider its suitability, not just in terms of specificity, sensitivity, or contextual-usability, but also with regard to applicability, usefulness (for example, shall the outcome change the management of the condition), and cost-effectiveness.

Arya and Agarwal have made a fair point by highlighting that our guidelines are more appropriate for circumstances, where a patient has not concomitantly been taking antibiotics. However, the point we made in our article[1] was that too many clinicians, in a somewhat automated fashion, request microscopy and culture on urine samples. We advised that some 'cerebral processing' be undertaken by evaluating the individual patient, the symptoms and the situation prior to requesting further laboratory investigations. Whether the bill is picked-up by an insurance company or government, the wastage of money, resources, and time surely cannot be a good thing. Please bear in mind that we specifically referred to uncomplicated UTIs, and not to systemic and recurrent infections, and also that we suggested a cut-off time-period (that is, 3 days) for having symptoms before further investigation, namely urine-culture, is undertaken.

Additionally, we should like to highlight that a number of units in the United Kingdom 'used to' screen for antibiotics in urine, in conjunction with culture. However, this practice was dropped many years ago, as it was found to 'not be cost-effective,' and as it did 'not give any additional information with regard to managing' the patients. We can, however, understand why Arya and Agarwal may find antibiotic-screening useful in a place such as theirs, where antibiotics may be freely acquired by anybody, and where patients may not be forthcoming with names of antibiotics. Furthermore, if upon microscopy, culture and sensitivity, an antibiotic was shown to be effective, but that the same antibiotic was being used by the patient, would it stop the clinician

from using it? This then begs the questions concerning dosage, patient-compliance, minimum inhibitory-concentrations, and notably, the side effects of other antibiotics to which the UTI-causing organism(s) is/are sensitive to. We do acknowledge that there is the potential risk of 'false negatives', by virtue of a reduction in bacterial colonies in patients who have been using antibiotics, but this further underscores the need for clinicians to take a thorough history (for example, specifically inquiring with regard to recent antibiotic-usage), and more cerebral processing by the clinician.

We should like to comment on a few issues mentioned by Arya and Agarwal: 1) It is better to refer to 'prescription-only' medications as opposed to 'OTC' (over-the-counter) - these terms are, strictly speaking, not synonymous. The inference here is that prescription-only drugs are those that necessitate the patient possessing a prescription further to input or supervision by a physician. Antibiotics are prescription-only drugs in the UK; 2) We do not understand how 1,680 urine samples have given 2494 culture-positive urine samples. Was it supposed to be the other way around?; 3) They have referred to "screening for antibacterial substances [as] not [being] an insurmountable task". There are 2 issues here. The first being the that insurmountable, that is, impossible or overwhelming, is not the same as placing strain on a system and definitely cannot be equated with good practice. There are a lot of things that can be carried out that are not 'impossible', but it does not make such practice appropriate or, indeed, correct. The second issue is that they stated that "screening (of) urine samples was feasible even more than 4 decades ago," but we feel that they have missed our point. 'Feasible' is not the same as 'efficient' or 'justifiable'. As we stated in our review article, we are of the fixed belief that we have a responsibility, especially in this age of antibiotic-resistance, to observe evidence-based practice and employ judicious use of antimicrobials. We would like to extend this to include 'sensible use of tests and equipment', to pay homage at the 'very least' to the fact that healthcare processes produce huge amounts of waste destined for the landfill sites. As such it would perhaps be better to modify the suggestion made by Arya and Agarwal that "it would be better to screen urine samples for culture for the presence of any antimicrobials to ensure a judicious therapeutic intervention" to instead read 'in patients where antimicrobials have been used during the symptoms of a UTI, it may be useful to screen urine samples for the presence of antimicrobials at the same time as undertaking culture and sensitivity, such that appropriate antimicrobials may then be used'.

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