Vol. 13(27), pp. 518-519, September, 2019
DOI: 10.5897/AJMR2019.9202
Article Number: 7500E6A61950
ISSN: 1996-0808

http://www.academicjournals.org/AJMR

ACADEMIC JOURNALS
expand your knowledge

African Journal of Microbiology Research

Letter to Editor

Region of acquisition of urinary tract infection (UTI) may be an important parameter while treating UTI cases

Bhoj Raj Singh

Division of Epidemiology, ICAR-Indian Veterinary Research Institute, Izatnagar, Bareilly, UP, India.

Received 26 August, 2019; Accepted 5 September, 2019

The study recently published on urinary tract infection (UTI) cases at Najran University Hospital, Najran region of Saudi Arabia (Alshabi et al., 2019), though small, only on 19 cases, have been concluded beautifully, "regional clinical data regarding the prevalence and efficacy of antibiotics should be taken into consideration along with the treatment guidelines". The authors reported a study on only 19 cases of UTI, of which 14 patients (73.68%) were positive for *Escherichia coli*, two (10.52%) each for *Staphylococcus aureus* and *Pseudomonas*, and one for *Staphylococcus haemolyticus.* However, in a recently published study, on 217 confirmed human cases of UTI from Rohilkhand, Bareilly region of Northern India (Singh, 2019), the picture was much different, the most common cause of UTI, *Escherichia coli,* was associated with only 22.12% cases, *S. aureus* was a rare (0.98%) cause of UTI but *S. haemolyticus* and other staphylococci caused 5.53 and 13.36% cases of UTI, respectively. In the Bareilly study, pseudomonads caused only 2.76% cases while other less known bacteria were responsible for more than 55% of the cases of UTI in humans. In Ireland too, only 14.3 and 19.4% cases of UTI were associated with *E. coli* infection in male and female, respectively (Tandan et al., 2016). Although in Nepal (Pandey et al., 2017), *E. coli* caused 78.6% and in Iran (Fallah et al., 2018) it caused 69% cases of UTI, similar to the study in Saudi Arabia (Alshabi et al., 2019), level of drug resistance was quite high. In a study in Nigeria (Ekwealor et al., 2016), *E. coli* was associated with only 24.6% cases of UTI and among the other causes *S. aureus* dominated the scene causing 28% of the UTIs, followed by *Staphylococcus saprophyticus* (20%) and streptococci and enterococci caused a sizeable number of cases (7.4%). Though *E. coli* is one of the most common cause of UTIs (Pandey et al., 2017) emergence of new pathogens including *Enterobacter, Enterococcus, Proteus, Klebsiella, Citrobacter, Raoultella, Streptococcus,* etc., are complicating the therapeutics of UTIs (Ekwealor et al., 2016; Howell and Fakhoury, 2017; Abejew et al., 2014).

In the study in Saudi Arabia (Alshabi et al., 2019), the most effective antibiotics on Gram-negative isolates were ceftriaxone (87.5%) followed by amoxycillin + clavulanic acid (81.25%), amikacin (75%), cefuroxime (75%), cefixime (68.75%) and mezlocillin (62.5%) and on Gram-positive isolates ceftriaxone, amikacin and amoxycillin + clavulanic acid were the most effective. The study reported only 35.71% of *E. coli* producing extended-spectrum beta-lactamases (ESBL) and compared similarity with a report from New Delhi (Akhtar et al., 2014). India is a big country with different climatic and socio-cultural regions and societies with different hygienic standards and health-care system in Delhi itself. In another study from Pondicherry in Southern India (Gopichand et al., 2019), of the 326 isolates, 319 (97.8%) were resistant to the third generation cephalosporins and produced ESBL while in a study in Bareilly, Northern India, 75% *E. coli* produced ESBL and the most effective antibiotics on Gram-negative bacteria were tigecycline (85.4%), followed by imipenem (83.9%), meropenem (81.7%), ceftriaxone (53.6%), gentamicin (52.8%), cefixime (34.9%) and amoxicillin + clavulanic acid (21.9%). On Gram-positive bacteria causing UTI in Bareilly (Singh, 2019), the most effective antibiotics were tigecycline (98%) followed by linezolid (96.6%), imipenem (84.9%), amoxycillin + sulbactam (83.9%), amoxycillin +

E-mail: brs1762@gmail.com. Tel: +91-8449033222.

clavulanic acid (67%), ceftriaxone (62.4%), gentamicin (44%) and cefixime (34.7%). Not only in India, in other countries too, emergence of antibiotic resistance in UTI causing bacteria towards the commonly prescribed antibiotics is reported (Tuem et al., 2018). In Ethiopia (Abejew et al., 2014), *E. coli* causing UTIs were much less often sensitive to ceftriaxone (53.1%), amoxycillin (15.4%) and gentamicin (66%), while older antimicrobials like nitrofurantoin and nalidixic acid were reported as the best options effective to inhibit >86% *E. coli* isolates (Abejew et al., 2014). The study in Ireland also reported low utility of amoxicillin + clavulanic acid (~5%) and nitrofurantoin was the most prescribed (>50%) and effective antimicrobial (Tandan et al., 2016). In Nigeria, resistance in UTI causing bacteria has been shown to be emerging for amoxycillin-clavulanic acid, cefuroxime, ceftazidime and cefixime (Ekwealor et al., 2016). In Nepal, where *E. coli* was the most common cause of UTIs, amikacin was reported to be effective only on 42.85% isolates and nitrofurntoin inhibited only 28.57% of *E. coli* isolates (Pandey et al., 2017).

In light of observations of the different contemporary studies in India (Gopichand et al., 2019; Singh, 2019), Saudi Arabia (Alshabi et al., 2019) and other countries (Tuem et al., 2018; Tandan et al., 2016; Ekwealor et al., 2016; Abejew et al., 2014) it may be concluded that the regional effect might be one of the most important factors for clinicians while treating UTI cases as suggested by Alshabi et al. (2019). Besides generalized guidelines for antibiotic uses in UTI (Anderson, 2019; Gopichand et al., 2019), considering the wide variation in antimicrobial susceptibility of bacteria causing UTI for an effective treatment of UTI cases guidelines have been issued time to time recommending the urine culture and antibiotic sensitivity before instituting the antimicrobial therapy (Wenzler and Danziger, 2016; Weese et al., 2011). Thus, while treating any case of UTI, clinicians must consider recent visits of UTI patient or region of acquisition or origin of UTI as an important parameter for instituting antimicrobial therapy.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

REFERENCES

Abejew AA, Denboba AA, Mekonnen AG (2014). Prevalence and antibiotic resistance pattern of urinary tract bacterial infections in Dessie area, North-East Ethiopia. BMC Research Notes 7(1):687.

Akhtar SM, Mohsin N, Zahak A, Ruhal AM, Pillai PK, Kapur P, Zaki AM (2014). Antimicrobial sensitivity pattern of bacterial pathogens in urinary tract infections in South Delhi, India. Reviews on Recent Clinical Trials 9(4):271-275.

Alshabi AM, Alshahrani MS, Alkahtani SA, Akhtar MS (2019). Prevalence of urinary tract infection and antibiotic resistance pattern in pregnant women, Najran region, Saudi Arabia. African Journal of Microbiology Research 13(26):407-413.

Anderson L (2019). Antibiotics For UTI Treatment - What Are My Options? https://www.drugs.com/article/antibiotics-for-uti.html.

Ekwealor PA, Ugwu MC, Ezeobi I, Amalukwe G, Ugwu BC, Okezie U, Stanley C, Esimone C (2016). Antimicrobial evaluation of bacterial isolates from urine specimen of patients with complaints of urinary tract infections in Awka, Nigeria. International Journal of Microbiology 2016:9740273, 6. Available on: https://doi.org/10.1155/2016/9740273.

Fallah F, Parhiz S, Azimi L, Rashidan M (2018). Distribution and antibiotic resistance pattern of bacteria isolated from the patients with community-acquired urinary tract infections in Iran: A cross-sectional study. International Journal of Health Studies 4(2):14-19

Gopichand P, Agarwal G, Natarajan M, Mandal J, Deepanjali S, Parameswaran S, Dorairajan LN (2019). *In vitro* effect of fosfomycin on multi-drug resistant gram-negative bacteria causing urinary tract infections. Infection and Drug Resistance 12:2005-2013.

Howell C, Fakhoury J (2017). A case of *Raoultella planticola* causing a urinary tract infection in a pediatric patient. Transationall Pediatrics 6(2):102-103.

Pandey DR, Amar A, Subedi A, Hussain Md S, Gupta M, Rauniar GP (2017). Antibiotic usage and its culture sensitivity pattern in urinary tract infections at tertiary hospital in Eastern Nepal. Kathmandu University Medical Journal 60(4):332-335.

Singh BR (2019). Urinary tract infections: The most common causes and effective antimicrobials. Technical Report, UTI-1, Indian Veterinary Research Institute, Izatnagar DOI: 10.13140/RG.2.2.31538.56005/1. Available: https://www.researchgate.net/publication/334544575_Urinary_tract_infections_The_most_common_causes_and_effective_antimicrobials

Tandan M, Duane S, Cormican M, Murphy AW, Vellinga A (2016). Reconsultation and antimicrobial treatment of urinary tract infection in male and female patients in general practice. Antibiotics 5(3):31 https://doi.org/10.3390/antibiotics5030031

Tuem KB, Gebre AK, Atey TM, Bitew H, Yimer EM, Berhe DF (2018). Drug resistance patterns of *Escherichia coli* in Ethiopia: A Meta-Analysis. BioMed Research International. 2018:4536905, 13 pages. Available on: https://www.hindawi.com/journals/bmri/2018/4536905/cta/.

Weese JS, Blondeau JM, Boothe D, Breitschwerdt EB, Guardabassi L, Hillier A, Lloyd DH, Papich MG, Rankin SC, Turnidge JD, Sykes JE (2011). Antimicrobial use guidelines for treatment of urinary tract disease in dogs and cats: Antimicrobial guidelines working group of the International Society for Companion Animal Infectious Diseases. Veterinary Medicine International 2011:263768, https://doi.org/10.4061/2011/263768.

Wenzler E, Danziger LH (2016). Urinary tract infections: Resistance is futile. Antimicrobial Agents and Chemotherapy 60(4):2596-2597.