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 (Ekwaelor 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 (Ekwaelor 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 amoxyccillin + clavulanic acid (81.25%), amikacin (75%), cefuroxime (75%), cefixime (68.75%) and mezlocillin (62.5%) and on Gram-positive isolates ceftriaxone, amikacin and amoxyccillin + 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%), amoxyccillin + sulbactam (83.9%), amoxyccillin +
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%), amoxicillin (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 amoxicillin-clavulanic acid, cefuroxime, cefazidime 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 nitrofurantoin 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


