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Microbiological Profile of UTI along with Their Antibiotic Sensitivity Pattern with Special Reference to Nitrofurantoin

Authors : Rupinder Bakshi, Geeta Walia, Anita Gupta

Abstract : Introduction: Urinary tract infections (UTI) are considered to be one of the most common bacterial infections with an estimated annual global incidence of 150 million. Antimicrobial drug resistance is one of the major threats due to widespread usage of uncontrolled antibiotics. Materials and Methods: A total number of 9149 urine samples were collected from R.H Patiala and processed in the Department of Microbiology G.M.C Patiala. Urine samples were inoculated on MacConkey's and blood agar plates by using calibrated loop delivering 0.001 ml of sample and incubated at 37 °C for 24 hrs. The organisms were identified by colony characters, gram's staining and biochemical reactions. Antimicrobial susceptibility of the isolates was determined against various antimicrobial agents (Hi – Media Mumbai India) by Kirby-Bauer disk diffusion method on Muller Hinton agar plates. Results: Maximum patients were in the age group of 21-30 yrs followed by 31-40 yrs. Males (34%) are less prone to urinary tract infections than females (66%). Out of 9149 urine sample, the culture was positive in 25% (2290) samples. Esch. coli was the most common isolate 60.3% (n = 1378) followed by Klebsiella pneumoniae 13.5% (n = 310), Proteus spp. 9% (n = 209), Staphylococcus aureus 7.6 % (n = 173), Pseudomonas aeruginosa 3.7% (n = 84), Citrobacter spp. 3.1 % (70), Staphylococcus saprophyticus 1.8 % (n = 142), Enterococcus faecalis 0.8%(n=19) and Acinetobacter spp. 0.2%(n=5). Gram negative isolates showed higher sensitivity towards, Piperacillin +Tazobactum (67%), Amikacin (80%), Nitrofurantoin (82%), Aztreonam (100%), Imipenem (100%) and Meropenam (100%) while gram positive showed good response towards Netilmicin (69%), Nitrofurantoin (79%), Linezolid (98%), Vancomycin (100%) and Teicoplanin (100%). 465 (23%) isolates were resistant to Penicillins, 1st generation and 2nd generation Cehalosporins which were further tested by double disk approximation test and combined disk method for ESBL production. Out of 465 isolates, 375 were ESBLs consisting of n 264 (70.6%) Esch.coli and 111 (29.4%) Klebsiella pneumoniae. Susceptibility of ESBL producers to Imipenem, Nitrofurantoin and Amikacin were found to be 100%, 76%, and 75% respectively. Conclusion: Uropathogens are increasingly showing resistance to many antibiotics making empiric management of outpatients UTIs challenging. Ampicillin, Cotrimoxazole, and Ciprofloxacin should not be used in empiric treatment. Nitrofurantoin could be used in lower urinary tract infection. Knowledge of uropathogens and their antimicrobial susceptibility pattern in a geographical region will help inappropriate and judicious antibiotic usage in a health care setup.

Keywords : Urinary Tract Infection, UTI, antibiotic susceptibility pattern, ESBL
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