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Efficacy of ceftriaxone-sulbactam-EDTA combination in immuno compromised patients in a tertiary care cancer centre

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Introduction: The resistance to the antimicrobials has been increasing over the years and is varying from country to country. Among the causes of β-lactam antibiotic resistance, the production of ESBLs appeared to be most common. The ESBLs are plasmid mediated and can be easily transmitted among members of *Enterobacteriaceae*, thus facilitating the dissemination of resistance, not only to β-lactam, but to other commonly used antibiotics including aminoglycosides and quinolone. To overcome ESBLs resistance, carbapenem drugs have been introduced in clinical settings, although carbapenems resistance has been reported increasingly worldwide. Resistance in bacteria to carbapenems is due to the production of carbapenem hydrolyzing enzymes called carbapenemases, which is encoded by KPC, VIM and IMP genes. The aim of the present study was to compare the susceptibility pattern of ceftriaxone-sulbactam-EDTA(CSE) combination with other routinely used antibiotics in immunocompromised patients.

Materials and Methods: A total of 33930 clinical samples were received in the Dept. of Microbiology in 2014. All the samples were processed as per standard microbiological methods. Antimicrobial susceptibility testing of cefoperazone-sulbactam, ceftriaxone-sulbactam-EDTA, piperacillin-tazobactam, imipenem and meropenem of 195 Gram negative isolates, included in this study, were carried out by disc diffusion methodas per CLSI guidelines. ATCC strains were used as standards. Interpretative criteria of Ceftriaxone were used for interpretation of CSE.

Results: Of the 33930 samples received, only 195 Gram negative isolates, from different clinical samples, were included in this study. Blood was the most common isolate followed by broncho- alveolar lavages, wound swabs and drain fluids. *Escherichia coli* was the commonest isolate followed by *Klebsiella pneumoniae, Pseudomonas aeruginosa* and *Acinetobacter* spp. Carbapenems were the most sensitive antimicrobial followed by cefoperazone-sulbactam, ceftriaxone-sulbactam-EDTA and piperacillin-tazobactam.

Conclusions: Results obtained in the current study clearly demonstrates the good *in-vitro* activity of ceftriaxone plus sulbactam plus EDTA as compared to other beta-lactam beta-lactamase inhibitor combinations. The enhanced susceptibility of ceftriaxone+EDTA+sulbactam against different clinical isolates is likely to be associated with synergistic activity of ceftriaxone+sulbactam+EDTA. EDTA chelates the divalent ions, thus enhancing the susceptibility of ceftriaxone plus EDTA plus sulbactam towards different microorganisms. The EDTA also enhances the susceptibility by altering the outer membrane permeability, which in turn increased penetration of drugs inside the bacterial cells.

Biography

Sanjay Biswas is a Professor & Microbiologist in the Dept of Microbiology in Tata Memorial Hospital, Mumbai, and completed his MBBS in Sambalpur University 1992 and MD (Microbiology) at Bombay University in October 1998.

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