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SUSCEPTIBILITY TESTS AND DECISION MAKING ON ANTIBIOTIC USE IN INTENSIVE CARE UNITS IN PALESTINE: IMPACT ON BACTERIAL RESISTANCE

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Abstract

Background and Objectives: We have noticed an unprecedented escalation of resistant bacteria to powerful antibiotics once been lifesaving in severe infections. what is/are the real reason(s) behind failure of potent broad spectrum IV antibiotics in treating serious bacterial infections in our hospitals after they were drugs of choice? Do they really fail in vivo or in vitro? assessment of false positive and false negative results for current bacterial culture and sensitivity tests. Determine bacterial resistance to most commonly used parenteral antibacterial agents in Intensive Care Units and factors affecting in vitro culture and sensitivity test results.

Methods: We collected samples from medical profiles of 906 patients who were given parenteral antibiotics for serious infections upon admission to ICU during the past 6 years. Specimens were directly streaked onto MacConkey agar or Blood agar media in order to identify bacteria. The antimicrobial susceptibility tests followed the Clinical and Laboratory Standards Institute (CLSI) guidelines. We categorized participants according to sample type. SPSS V 23 was used for data analysis.

Results: We analyzed the results of culture and sensitivity tests of blood, urine, and body fluids- including saliva- samples from 906 participants (56.6 % males, age was 57.33 ± 23.01 years). Using Fischer exact test, we found significant relationship between sample type and antibacterial drug resistance among patients who received one of these antibiotics: amoxicillin / clavulanic acid, ceftriaxone, cefotaxime, cefuroxime, tazobactam, meropenem, ciprofloxacin, levofloxacin, ceftazidime, or amikacin, at p value = 0.000 for each of these antibiotics. There was a significant relationship between type of bacteria and resistance to amoxicillin/clavulanic acid, p = 0.004 or cefoxitin, p = 0.000. Using Fisher exact test, we found a significant relationship between type of bacteria and sample type (p=0.000). Then we track drug resistance in the past 5 years where we found escalation of drug resistance for most commonly used IV antibiotics in ICUs from 2019-2024.



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Conclusions: Bacteria might behave differently, resistance wise, according to type of sample. For culture and sensitivity test, we should grow bacteria in conditions that mimic the site of infection they were taken from.

Keywords: antibacterial agents, ICU, bacterial resistance, sensitivity tests, sample type, culture media, empiric antibiotic choice