14th International Conference on **Microbial Interactions & Microbial Ecology**
&
11th Edition of International Conference on **Advances in Microbiology and Public Health**
August 19-20, 2019 Vienna, Austria

Beta-lactamase producing bacteria in community and hospital setting in Riyadh: Occurrence, and susceptibility to antibiotics

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Extended-spectrum β-lactamase producing bacteria (ESBL) pose an increasing challenge to both public health and hospital infection control services. To determine the prevalence of ESBL producing bacteria, types of infection they cause and their susceptibility patterns to antibiotics in hospital and community settings. This is a cross-sectional study that was conducted at a Medical City in Riyadh. All clinical specimens with positive culture for Gram-negative bacteria were collected from the microbiology laboratory for the year 2013. When bacteria are identified as ESBL strain, the antimicrobial susceptibility is analyzed. Demographic data were collected from patients' records. Overall, 763/6993 (10.9%) were ESBL producing strains. The highest detection of ESBL bacteria were from specimens of patients over sixty years (34.2%), and 23.7% were from 0-<15-year-old. The most frequently detected bacteria was E. coli (76.5%) with highest detection from urine, skin swab, blood, wound and ulcer specimens, followed by *K. pneumonia* (23.1%) with highest detection from respiratory specimens including sputum. The resistance pattern to antimicrobials was (75.5%, 81.3%) to trimethoprim/sulfamethoxazole, (69.7%, 42.6%) to ciprofloxacin, (38.9%, 58.5%) to gentamicin and (8.7%, 30.7) to piperacillin/tazobactam (*E. coli*, *K. pneumonia respectively*). However, very high sensitivity to imipenem and meropenem was reported for both bacteria. Generally, ESBL bacteria isolated from outpatients showed significantly higher resistance to ciprofloxacin than the isolates from inpatients (p=0.02), conversely is detected with piperacillin/tazobactam (p<0.0001). Currently, carbapenems and amikacin are the first line antibiotics that can be used for the treatment of ESBL bacterial infections in both settings.

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