

Study of Antibiotic Resistance in *Pseudomonas aeruginosa* Strains

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Background & Objectives: More than half of all clinical isolates produce the blue-green pigment pyocyanin. These pathogens are widespread in nature, inhabiting soil, water, plants, and animals (including humans). *Pseudomonas aeruginosa* has become an important cause of infection, especially in patients with compromised host defense mechanisms. Biofilms, communities of cells adhering to a substratum, likely represent the prevalent form of microorganisms in nature. Resistance to antimicrobials is a general feature of all biofilms that are the major cause of recalcitrant infections. Biofilms might be responsible for 65% of all bacterial infections. One obvious difference between planktonic cells and biofilm is the presence of a polysaccharide matrix enveloping the community that retards diffusion of antimicrobials into the biofilm.

Methods: Strains isolated from various clinical specimens November 2010 from Amam Ahvaz Hospital, Iran. The bacteria were grown in Luria-Bertani (LB) broth or LB agar containing the appropriate antibiotics. All samples were subjected to disk diffusion susceptibility testing. Minimum Inhibitory Concentrations of piperacillin, cefoperazone, ceftazidime, cefotaxime, cefepime, imipenem, meropenem, gentamicin, amikacin, tobramycin, and ciprofloxacin for 100 *Pseudomonas aeruginosa* strains isolated.

Results: *Pseudomonas aeruginosa* strains were the most sensitive to ceftazidime (78.9%), imipenem (73.6%), meropenem (70.9%) and the most resistant to gentamicin (54.1%) and ciprofloxacin (52.5%).

Conclusion: Multi-drug resistant *Pseudomonas aeruginosa* nosocomial infections are increasingly recognized worldwide. aminoglycosides (gentamicin, amikacin, tobramycin), quinolones (ciprofloxacin, levofloxacin, but not moxifloxacin), cephalosporins (ceftazidime, cefepime, cefoperazone, ceftazidime, but not cefuroxime, ceftriaxone, cefotaxime), antipseudomonal penicillins: ureidopenicillins and carboxypenicillins (piperacillin, ticarcillin: *P. aeruginosa* is intrinsically resistant to all other penicillins), carbapenems (meropenem, imipenem, doripenem, but not ertapenem), polymyxins (polymyxin B and colistin), monobactams (aztreonam). The risk of emergence of antibiotic resistance may vary with different antibiotic treatments.

Keywords: Antibiotic Resistance; *Pseudomonas aeruginosa*; Clinical Isolates