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Short Communication

A Survey on Antimicrobial Sensitivity Pattern of Different Antibiotics on Clinical Isolates of *Pseudomonas aeruginosa* Collected from Dhaka City of Bangladesh

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Abstract

A study of antimicrobial sensitivity of *Pseudomonas aeruginosa* isolated from clinical sources from different diagnostic centers, Dhaka, Bangladesh was carried out to facilitate the preference of drug in the management of *Pseudomonas aeruginosa* induced symptoms. Very low sensitivity of *P. aeruginosa* towards co-trimoxazole (45%), azithromycin (30%) and erythromycin (35%) was observed. Higher sensitivity pattern was observed for cefuroxime (57.5%). and only imipenem (100%) has shown sensitivity pattern possibly susceptible enough to consider for the management of *P. aeruginosa* induced cases in the area under study. The low sensitivity to different antimicrobial could be attributed to their prevailing usage and abuse in the area under study.

Keywords: Antimicrobial sensitivity; Clinical isolates; *Pseudomonas aeruginosa.*

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1. Introduction

Antimicrobial agents (antibiotics and related medicinal drugs) have substantially reduced the threat posed by infectious diseases. 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 [1]. It is a frequent cause of nosocomial infections such as pneumonia, urinary tract infections (UTIs), and bacteremia. Pseudomonal infections are complicated and can be life threatening [2].

In this study, the sensitivity of *P. aeruginosa* strains isolated in Dhaka city, Bangladesh was investigated against different antimicrobial agents to provide supportive

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implications for the proper treatment of *P. aeruginosa* induced infections and related complications [3].

2. Materials and Methods

Patients were referred by community practitioners, clinics, and hospitals throughout Dhaka City, Bangladesh. Forty isolates of *P. aeruginosa* from these patients were chosen for this study. The specimens obtained were urine samples, pus samples, blood samples. The specimens were collected according to Cheesbrough [4]. Specimens were cultured on Cetrimide agar (HIMEDIA, India) plate, after which the cultural and morphological characteristics of the isolates were studied. Identification of isolates was done by standard microbiological methods as described by Cheesbrough [4] and Cowan [5].

The antimicrobial sensitivity test of each isolate was carried out by the Kirby-Bauser disc diffusion method [6] as per recommendation of National Committee for Clinical Laboratory Standards [7]. This method allowed for rapid determination of in vitro efficacy of a drug by measuring the diameter of the zone of inhibition that results from diffusion of the agent into the medium surrounding the disc. Mueller-Hinton agar (HIMEDIA, India) plates were used for the disc diffusion tests. The discs used (HIMEDIA, India) contained following antibiotics: azithromycin (30µg), levofloxacin (5µg), cefeclor (30 µg), imipenem (10 µg), cotrimoxazole (25 µg), cefuroxime (30 µg), erythromycin (15 µg). The medium was poured into sterile petridishes and the inoculums were adjusted to contain 10^5 to 10^7 bacteria per ml. The discs were then placed on the petridishes seeded with the bacterial inoculums over the medium and allowed to diffuse at 4°C for 5-6 hours. The petridishes were then incubated at 37°C for 18 hours and the zones of inhibitions observed were measured [8].

3. Results and Discussion

Forty clinical isolates of *P. aeruginosa*, obtained from different diagnostic centers, were subjected to antimicrobial sensitivity test against levofloxacin, azithromycin, cefeclor, co-trimoxazole, imipenem, cefuroxime, erythromycin and the observed sensitivity was recorded (Table 1). With the sensitivity of 100%, imipenem was demonstrated as the most susceptible antimicrobial followed by cefuroxime (57.5%). Incredibly diminutive sensitivity was observed for co-trimoxazole (45%), azithromycin (30%) and erythromycin (35%).

Table 1. Antimicrobial sensitivity pattern of clinical isolates of *P. aeruginosa*.

Isolates	No. of *P. aeruginosa*	Azithro-mycin	Co-trimoxazole	Cefeclor	Imipenem	Levo-floxacin	Cefuroxime	Erythro-mycin
P. aeruginosa	40	12 (30%)	18 (45%)	9 (22.5%)	40 (100%)	13 (32.5%)	23 (57.5%)	14 (35%)

The variation found in the sensitivity pattern to these commonly used drugs in the present study could be attributed to the prevailing usage and abuse of the drugs in the area under study. The lower sensitivity to the commonly used drugs indicates the dependence of the prescribers on these drugs in contrast to imipenem, which is less commonly used. This further suggests the relation between antibiotic usage and the level of drug resistance encountered. The rationale use of antibiotic by the health professional and efforts to control procurement and use of antibiotics officially in the locality will probably help to limit the increasing rate of drug resistance in the pathogens. Rational drug policy should be in use before potent antibiotics are introduced to the country [9]. Antibiotic administration should follow certain minimal requirements [3]. To restore efficacy, to earlier antibiotics and to maintain the success of new antibiotics that are introduced, it need to use antibiotics in a way, which assures an ecological balance that favors the predominance of susceptible bacterial flora [10]. In Bangladesh, empirical therapy is the rule rather than the exception [11] and in this context of changing the dynamics of resistance to antibiotics, it is imperative for optimal patient care that constant evaluation of antibiotic sensitivity pattern of pathogens for commonly used antimicrobial agents in a particular environment is carried out.

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