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LETTER TO THE EDITOR

Resistance Pattern Of Pseudomonas Aeruginosa Isolates From Surgical Wounds

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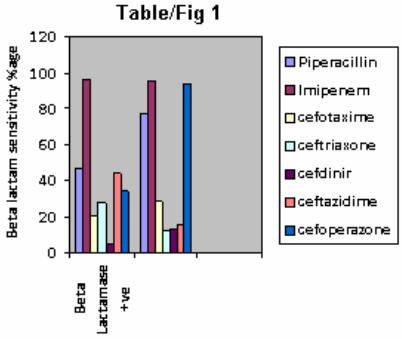
Dear Editor

Pseudomonas aeruginosa is a major cause of nosocomial infections. Despite advances in sanitation facilities and the introduction of wide variety of antimicrobial agents with antipseudomonal activities, life threatening infections caused by this agent continue to cause devastations in the hospitals. The resistance in *Pseudomonas aeruginosa* is mainly mediated by Beta Lactamases[1]. Though the major ones are metallo beta lactamases but a number of studies indicate the presence of Extended Spectrum Beta Lactamases (ESBLs) in Pseudomonas as well [2],[3].

This study was a retrospective study done in Department of Microbiology, Government Medical College, Amritsar, from March 2004 to August 2005. In this study, antimicrobial susceptibility testing of isolates was done by Kirby-Bauer disc diffusion method and ESBL production was detected by double disc potentiation technique. A total of 400 isolates of *Pseudomonas aeruginosa* both from indoor patients and patients attending out patient department who were having surgical wound infections, were included in the study. The samples included were pus/ pus swabs/ aspirations from the wounds. The samples were inoculated on the blood agar and Mac-Conkey agar and passed in brain heart infusion broth, immediately and incubated for 18-24 hours at 37□ C aerobically. The organism was identified by its culture characteristics, gram staining and various biochemical reactions performed by standard bacteriological methods. Each isolate was evaluated for susceptibility to nine different antibiotics i.e cefotaxime, ceftriaxone, ceftazidime, cefdinir, amikacin, gentamicin, ciprofloxacin, piperacillin and imipenem. ESBL production was detected by double disc potentiation method by applying disc of cefoperazone [75µ] and combination of cefoperazone-sulbactam [75/30µ]. The results were interpreted according to Clinical Laboratory Standard Institute (CLSI) guidelines[4].

Out of 400 isolates, 312(78 %) were from male patients and 88(22 %) were from female patients. Majority, 191(47.75%) of the strains were isolated from patients between 21-60 years of age. Most of them 370(92.5 %) were isolated from hospitalized patients and the rest 30(7.5 %) were from outdoor patients. Maximum resistance was seen to third generation cephalosporins-69.7% to cefotaxime,81.7% to ceftriaxone,73.5% to ceftazidime,92% to cefdinir. Amikacin showed resistance in 41.5% and Gentamicin in 79% of the isolates. Ciprofloxacin resistance was seen in 73.2% isolates while piperacillin resistance was seen in 44% of the isolates. Minimum resistance was seen to imipenem -3.7%. In *Pseudomonas aeruginosa*, ESBL production was observed to be 61.25 %. The susceptibility pattern of both Pseudomonas aeruginosa isolates - ESBL producers and ESBL non producers to various beta lactam antibiotics, is being shown in the [Table/Fig 1].

Table/Fig 1



Ps. aeruginosa isolates showing sensitivity patterns in beta lactamase producers and non producers against beta lactum antiboitics.

In every age group, predominance was seen among the males. Our's is a male dominated society, where male report to the hospitals more often than females. Moreover most of the affected male patients were fields-workers and agriculturists. Arfas et al reported predominance of males (68%) in their study[5]. Other workers have observed majority of isolates from hospitalized patients to be *Pseudomonas aeruginosa*[6].

The present study highlights that the *Pseudomonas aeruginosa* remains an important cause of nosocomial wound infections. The incidence of beta lactamases producing *Pseudomonas aeruginosa* is on the rise. Though, metallo beta lactamases are the main enzymes in *Ps.aeruginosa* but ESBLs are also found in these isolates. As regards the method of detection, there is no guideline for detection of ESBLs in *Ps.aeruginosa* from CLSI .We used a method of double disc potentiation using sulbactam as inhibitor of beta lactamase instead of clavulanic acid. As it has been shown that combination of cefoperazone and sulbactam has high in vitro activity for *Ps.aeruginosa* [7]. Also, Clavulanic acid which is recommended in ESBL detection for other gram negative bacteria , can induce expression of cephalosporinase and antagonize the antibacterial activity in *Ps.aeruginosa*[8]. In this study, Multi drug resistant Pseudomonas aeruginosa were seen in most of the strains and majority showed resistance to the cefaperazone-sulbactam as well. Further, this study also reveals that resistance is developing to imipenem also. In a study on burn wounds from North India, 3 % resistance to imipenem in *Pseudomonas aeruginosa* strains has been reported [9]. Another study also reports 17.32 % resistance to imipenem [10].

This study thus gives the alarming signal for the future, making the therapeutic options more difficult. Strict infection control measures are to be followed to contain the so called water and soil organism as *Pseudomonas aeruginosa.*

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