

Pseudomonas aeruginosa

(2002/6/5 2001/12/26)

<i>Pseudomonas</i>	(6)	
		<i>aeruginosa</i>
,Amikacin Tobramycin		(15)
(%83.3)	Ciprofloxacin ,Gentamicin	(%100)
Gentamicin		
Minimum	,Amikacin,Tobramycin,Ciprofloxacin	
	Inhibitory Concentrations (MICs)	
Amikacin ,Tobramycin		
Gentamicin	/	(25-20)
(80- / (320-12.5)	Ciprofloxacin /	12.5)

Study on Sensitivity of *Pseudomonas aeruginosa* Isolated from Cystic Fibrosis to Different Antibiotics

Subhi H. Khalaf
Department of Biology
College of Science
Mosul Univercity

ABSTRACT

Antibiotic sensitivity test was carried out to (6) isolates of *Pseudomonas aeruginosa* isolated from patients with cystic fibrosis in Mosul city. The test was carried out to (15) antibiotics by disc method , the isolates were sensitive to Tobramycin and Amikacin (100%) , followed by Gentamicin and Ciprofloxacin (83.3%), while they were resistant to the rest of the antibiotics tested. Two-fold dilutions were prepared from Tobramycin , Amikacin, Gentamicin and Ciprofloxacin to determine the Minimum Inhibitory Concentrations (MICs). Tobramycin and Amikacin had (MICs) values in the range of (20-25) µg/ml,while (MICs) values for gentamicin were in the range of (12.5-80) µg/ml and for Ciprofloxacin in the range of (12.5-320) µg/ml.

Pseudomonas aeruginosa

Cystic fibrosis

; Bodey et al., 1983)

.(Brooks et al., 2001; Forbes et al., 1998

Ps.aeruginosa

(Bodey et al., 1983 ;Brook and Fink, 1983)

fimbriae

Adhesins

Alginate

capsule

Phospholipase

Haemolysins

Elastase

Invasins

Leukocidin

Lecithinase

Endotoxin

Exotoxin A Exoenzyme S

Lipopolysaccharides

proteases

Slime layers

.(Brooks et al., 2001; Moss, 199 ; May et al., 1991 ; Bodey et al.,

1983).

Cystic Fibrosis

Ps.aeruginosa

Phenotype

Alginate

. (Marty et al.,1998; May et al., 1991; Brook and Fink, 1983)

Ps.aeruginosa

-

. (Colom et al. , 1995; Sposini et.al., 1993)

(Savoia et al. , 1996 ; Michea-Hampzehpour et al., 1994)

Ps.aeruginosa (6)

. (Koneman et al., 1997)

Minimum Inhibitory Concentrations (MICs)

(1) (15)

Oxoid

(Baron and Finegold, 1990 ;Cruickshank et al., 1975)

.(Vandepitte et al., 1991)

(Bauer et al., 1966) Oxoid

(Vandepitte et al., 1991)

Normal Saline

. (Baron and Finegold, 1990) ⁸ / (10x1)

(24-18) (37)

.(Vandepitte et al., 1991)

(2) Tobramycin, Amikacin Gentamicin , Ciprofloxacin
(24-18)

(24-18) (37)

(Atlas et al., 1995 ; Cruickshank et al., 1975)

: 1

/	
5	Ciprofloxacin
30	Cefuroxime
30	Cefexime
30	Ceftazidime
30	Amikacin
30	Tobramycin
30	Kanamycin
10	Streptomycin
10	Gentamicin
30	Amoxicillin-Clavulinic Acid
100	Carbenicillin
30	Tetracycline
30	Trimethoprim-Sulfamethoxazole
30	Chloramphenicol
30	Rifampicin

:A2

(MIC)

: B2

(MIC)

(/)									
1.56	3.12	6.25	12.5	25	50	100	200	400	Ciprofloxacin
1.56	3.12	6.25	12.5	25	50	100	200	400	Tobramycin
1.56	3.12	6.25	12.5	25	50	100	200	400	Amikacin
1.56	3.12	6.25	12.5	25	50	100	200	400	Gentamicin

Ps.aeruginosa

. (Forbes et al., 1998; Savoia et al., 1996)

Carbenicillin

. (3)

(%100)

Ps.aeruginosa

Trimethoprim-

Amoxicillin-.Clavulinic acid

.Sulfumethoxazole, Tetracycline,Chloramphinicol , Rifampicin

(%100)

Ceftazidimet , Cefexime ,Cefuroxime

Ceftazidime

Ps.aeruginosa

Extended - Spectrum β - Lactameses

-

. (Kessler and Fung-Tomc, 1996; Jones, 1996)

Ps.aeruginosa

Aminoglycosides

(%83.3)

Gentamicin

(%100)

Amikacin , Tobramycin

Kanamycin

Streptomycin

Fluoroquinolones

Ciprofloxacin

. (%100)

(%83.3)

Fluoroquinolones

.Ciprofloxacin

(MICs)

Amikacin , Tobramycin

(MICs)

(4)

Gentamicin

/

(25-20)

(MIC)

/

(80-12.5)

(320- (MICs) Ciprofloxacin . (3)
 (3) / 12.5)
 (/ 320) (MIC) Ciprofloxacin
 Tobramycin . Ciprofloxacin
 Ciprofloxacin , Gentamicin Amikacin ,
 Aminoglycosides
 . Fluoroquinolones
Ps.aeruginosa

. (Brooks et al., 2001; Colom et al., 1995; Sposini et al., 1993)

Permeability barrier -

-

PSE-1 -

. (Koneman et al., 1997; Kessler and Fung-Tomc, 1996; Jones, 1996) Carbenicillinase

. (Brooks et al., 2001 ;Millesimo et al., 1996)

Aminoglycosides modyfyin

Ps.aeruginosa

Enzymes

DNA gyrase

Fluoroquinolones

R-factors

. (Koneman et al., 1997 ;Garrod et al., 1981)

Ps.aeruginosa

: 3

(%)	(%)	(%)	
(0.0)0	(0.0)0	(100)6	Amikacin
(0.0)0	(0.0)0	(100)6	Tobramycin
(0.0)0	(16.66)1	(83.33)5	Gentamicin
(16.66)1	(0.0)0	(83.33)5	Ciprofloxacin
(100)6	(0.0)0	(0.0)0	Kanamycin
(100)6	(0.0)0	(0.0)0	Streptomycin
(100)6	(0.0)0	(0.0)0	Carbenicillin
(100)6	(0.0)0	(0.0)0	Cefuroxime
(100)6	(0.0)0	(0.0)0	Cefexime
(100)6	(0.0)0	(0.0)0	Ceftazidime
(100)6	(0.0)0	(0.0)0	Amoxicillin- Clavulinic acid
(100)6	(0.0)0	(0.0)0	Rifampicin
(100)6	(0.0)0	(0.0)0	Chloramphenicol
(100)6	(0.0)0	(0.0)0	Trimethoprim- Sulfamethoxazole
(100)6	(0.0)0	(0.0)0	Tetracycline

Ps.aeruginosa

(MICs)

: 4

(/)

(6)	(5)	(4)	(3)	(2)	(1)	
20	20	20	25	20	25	Amikacin
20	20	25	25	20	20	Tobramycin
20	20	25	80	25	12.5	Gentamicin
12.5	12.5	20	25	320	20	Ciprofloxacin

REFERENCES

- Atlas, R.M., parks, L.C. and Brown, A.E., 1995. Laboratory Manual of Experimental Microbiology. Mosby- year Books, Inc. U.S.A. 385 p.
- Baron, E.J. and Finegold, S.M., 1990. Bailey & Scott's diagnostic microbiology. 8th .ed. C.V. Mosby Company, USA.
- Bauer, A.W., Kirby, W.A.M., Sherris, J.S. and Turk, M., 1966. Antibiotic susceptibility testing by a standardized single disk method. Am.J.Clin . Pathol. 45: pp.493-496

- Bodey, G.P., Bolivar, R., Fainstein, V. and Jadeja, L., 1983. Infections caused by *Ps.aeruginosa*. Rev.Infect. Dis. 5: pp.279-313.
- Brook, I. and Fink, R., 1983. Transtracheal ampiration in pulmonary infection in children with cystic fibrosis Eur.J.Res.Dis.64: pp.51-57
- Brooks, G.F., Butel, J.S. and Morse, S.A., 2001. Jawetz, Melnick & Adelberg's Medical Microbiology 22 nd.ed. Lange Medical Books /McGraw-Hill Inc. U.S.A. 694 p.
- Colom, k., Fdz-Aranguize, A., Suinaga, E., Cisterna, R., 1995. Emergence of resistance to B-Lactam agents in *Pseudomonas aeruginosa* with group β -Lactamases in spain. Eur.J.Clin.Microbiol. Infect. Dis. 14: pp.964-971.
- Cruickshank, R., Duguid, J.P., Marmion, B.P. and Swain, R.H.A., 1975. Medical microbiology , Vol. 2 , The practice of medical microbiology . 12th .ed . Churchill Livingstone , England.
- Forbes, B.A., Sahm, D.F. and Weissfeld, A.S., 1998. Bailey & Scott's Diagnostic Microbiology 10 th. ed. Mosby Inc. U.S.A 1072 P.
- Garrod, L.P., Lambert, H.P., Ogrady, F. and Waterworth, P.M., 1981. Antibiotic and chemotherapy . 5th. ed. Churchill Livingstone , Edinburgh , England.
- Jones, R.N., 1996. Impact of changing pathogens and antimicrobial susceptibility patterns in the treatment of serious infections in hospi-talized patients . Am. J.Med. 100 (Suppl.6A): pp.3s-12s
- Kessler, R.E. and Fung-Tomc, J., 1996. Susceptibility of bacterial isolates to beta-lactam antibiotics from U.S. clinical trails over a 5-year period . Am.J.Med. 100(suppl.6A) : pp.13s-19s
- Koneman, E.W., Allen, S.D., Janda, W.M., Schreckenberger, P.C. and Winn, W.C., 1997. Color atlas and textbook of diagnostic microbiology. 5th. ed. Lippincott-Raven Publishers, Philadelphia, USA , pp. 171-220
- Marty, N., Pasquier, C. and Shemin, K., 1998. Effects of characterized *Pseudomonas aeruginosa* exopolysaccharides on adherence to human tracheal cells. J.Med.Microbiol.47(2): pp.124-134.
- May, T.B., Shinabarger, D. and Maharaj, R., 1991. Alginate Synthesis by *Ps.aeruginosa*: a key pathogenic factor in chronic pulmonary infections of Cystic fibrosis patients.Clin. Microbiol. Rev.4: pp.191-206.
- Michea-Hampzhepour, M., Kahar, A. and Penchere, J.C., 1994. In vitro selection of resistance to quinolones , β -Lactams and amikacin in nosocomial gram-negative bacilli. Infection,22(Suppl.2),2: pp.105-110.
- Millesimo, M., Intinis, D.G., Chirillo, G.M., Musso, T. and Savoia, D., 1996. *Pseudomonas aeruginosa* clinical isolates: serotype , resistance, phenotype & Plasmid profile. Eur.J.Epidemiolo. 12: pp.123-129.
- Moss, R.B., 1995. Cystic fibrosis : Pathogenesis , pulmonary infection, and treatment. Clin-Infect. Dis 21: pp.839-851.
- Savoia, D., Ricatto, I., Millesimo, M., De-Intinis, G. and Daglio, C., 1996. A one year survey of respiratory and urinary pathogens and their antimicrobial susceptibility. New-Microbiol. 19(1): pp.59-66.
- Sposini, T., Bastianini, L., Dalo, F., Verducci, N. and Sbaraglia, G., 1993. Antibiotic resistance in nosocomial gram-negative strains. Enr.Bullt.
- Vandepitte, J., Engback, K., Piot, P. and Hench, C.C., 1991. Basic laboratory procedures in clinical bacteriology . World Health Organization , Geneva, Switzerland.