

## **RESISTANCE PATTERN OF CLINICAL ISOLATES FROM CASES OF CHRONIC EAR INFECTION II**

**ADAM ALI, S. BAQAR SHYUM NAQVI AND DILNAWAZ SHEIKH**

*Department of Pharmaceutics, Faculty of Pharmacy  
University of Karachi, Karachi-75270, Pakistan*

### **ABSTRACT**

During present study hundred clinical isolates from cases of ear infection were tested from local population for resistance pattern, using eleven different antibiotics. A considerable percentage of isolates causing ear infection was resistant to number of antimicrobial drugs. The percentages of organisms isolated from ear infection are *Pseudomonas aeruginosa* (50%), *Proteus* species (16%), *Staphylococcus aureus* (15%), *Klebsiella* species (13%) and *Escherichia coli* (6%).

### **INTRODUCTION**

Otitis media is a common infection in children referring to inflammation (fluid and infection) of the middle ear. Its complications include permanent ear damage, decrease in hearing and sometimes serious sequelae such as extension of the infection to the intracranial space (Robert et al. 1995).

Two important causes of otitis are:

- (a) Eustachian tube dysfunction
- (b) Bacterial infection.

Bacterial infection although not present in all cases, is a contributing factor in most cases.

Keeping in view the widespread use of antibiotics in the community, and the high rate of resistance to antibiotics in clinical isolates, this study was designed to:

- (a) See the pattern of different organisms causing ear infections in the community.
- (b) Determine the sensitivity of clinical isolates to different antibiotics.

### **MATERIALS AND METHODS**

One hundred clinical isolates from cases of ear infection were collected from laboratories of different hospitals.

The cultures were identified on the basis of colony characteristics on different media and biochemical reactions. For sensitivity studies the cultures were maintained on nutrient agar slants.

Sensitivity to different antibiotics was performed by agar diffusion disk method according to NCCL standards as described by Lorian (1991). In brief, cultures were grown in Muller-Hinton broth at 37°C for 2-8 hours. Turbidity of broth cultures was matched with that of a MacFarland Standard No.5. Muller-Hinton agar plates were seeded with appropriate cultures using a sterile swab. Disks of different antibiotics were placed on agar surface using a sterile forcep. Results were recorded after 24 hours incubation and interpreted according to the guidelines described by Lorian (1991).

## RESULTS AND DISCUSSION

Table 1 *Pseudomonas aeruginosa* exhibited a high degree of resistance to amoxycillin (74%) and ampicillin (68%). Resistance to combination drugs was less than the single drug. *Pseudomonas isolates* showed still higher resistance against two cephalosporins tested i.e. cephadrine (78%) and cefaclor (70%). Resistance against two aminoglycosides tested was less than 13-lactams, though still quite high i.e. 32% against gentamicin and 18% against tobramycin.

Among quinolones ciprofloxacin seems to be most effective (8% resistance) while ofloxacin was less effective (16%).

Kenna et al. (1986) reported that in chronic suppurative otitis media the most common organisms are *Pseudomonas aeruginosa* and *S. aureus*. Most strains produce  $\beta$ -lactamase.

Resistance against aminoglycosides in *Pseudomonas aeruginosa* isolates has been reported by several workers (Duncan et al. 1981, Rubens et al. 1981, Furusawa et al. 1986). Different rates of resistance have been reported and overall 20-40% resistance is a common observation.

*Proteus* isolates were also highly resistant to many antibiotics tested. The highest seems to be against ampicillin (87%), amoxycillin and gentamicin (62%). The lowest rates were against quinolones, ofloxacin (12%) and enoxacin, ciprofloxacin (6%).

Several workers have reported that 91-100% of patients, with otitis media were clinically cured when treated with amoxycillin/clavulanic acid combination (Gun et al. 1991). However isolates in the present study showed a high degree of resistance of these combination of drugs.

*Klebsiella* isolates showed highest resistance against penicillins, cephalosporins and lowest against gentamicin and quinolones (23%).

*Escherichia coli* isolates were highly resistant to all the drugs tested. Considering their small number in the study further comment does not seem justified.

*Staphylococcus aureus* isolates were highly resistant to ampicillin, amoxicillin and combination of drugs i.e. 80 and 86% respectively against ampicillin and amoxicillin. Cephadrine and cefaclor seemed to be comparatively more effective against *S. aureus* isolates i.e. 33% and 26% resistance respectively. Resistance against quinolones was much less as compared to other drugs.

This degree of resistance to different antibiotics is not surprising. Because unprecise, improper and indiscriminate use of all kinds and forms of antibiotics is very common in our community. There is a significant difference in the bacteriology of chronic and acute otitis media (Ryan, 1994).

Keeping in view the chronicity of ear infections and the preference of health given in our society, it is not all the unexpected that most of these isolates were resistant to commonly used antibiotics.

**Table-1**  
**Antibiotic Susceptibility of Clinical Isolates from Ear Infection**

S.No. i	Name of the antimicrobial agent	Name of organism									
		a		b		c		d		e	
		<i>Pseudomonas aeruginosa</i> (50)		<i>Proteus spp.</i> (16)		<i>Staphylococcus aureus</i> (15)		<i>Klebsiella</i> (13)		<i>Escherichia coli</i> (6)	
S	R	S	R	S	R	S	R	S	R		
<b>A. SEMI SYNTHETIC PENICILLIN:</b>											
1.	Amoxycillin	13	37 (74%)	6	10 (62.5%)	3	12 (80%)	3	10 (76.92%)	1	4 (66.66%)
2.	Ampicillin	16	34 (68%)	2	14 (87%)	2	13 (86.66%)	3	10 (76.92%)	2	4 (66.66%)
<b>B. COMBINED THERAPY:</b>											
3.	Ampicillin/ Cloxacillin	18	32 (64%)	7	9 (56.25%)	6	9 (60%)	4	9 (69.2%)	3	3 (50%)
4.	Amoxycillin/ Clavuanic Acid	19	31 (62%)	12	4 (25%)	5	10 (66.66%)	4	9 (69.2%)	3	3 (50%)
<b>C. CEPHALOSPORIN GROUP:</b>											
5.	Cephadrine	11	39 (78%)	11	5 (31.25%)	10	5 (33.33%)	4	9 (69.2%)	2	4 (66.66%)
6.	Cefaclor	15	35 (70%)	11	5 (37.5%)	11	4 (26.66%)	5	8 (61.53%)	3	3 (50%)
<b>D. AMINOGLYCOSIDES:</b>											
7.	Gentamicin	34	16 (32%)	6	10 (62.5%)	8	7 (46.66%)	10	3 (23%)	3	3 (50%)
8.	Tobramycin	41	09 (18%)	14	02 (12.5%)	8	7 (46.66%)	09	4 (30.7%)	3	4 (50%)
<b>E. QUINOLONES:</b>											
9.	Ofloxacin	42	08 (16%)	14	02 (12.5%)	13	2 (13.33%)	10	3 (23.07%)	3	3 (50%)
10.	Enoxacin	45	05 (10%)	15	01 (6.25%)	14	1 (6.66%)	10	3 (23.07%)	3	3 (50%)
11.	Ciprofloxacin	46	04 (8%)	15	01 (6.25%)	13	2 (13.33%)	10	3 (23.07%)	3	3 (50%)

S = Sensitive, R = Resistant





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