

SUSCEPTIBILITY OF PROTEUS AND KLEBSIELLA TO ANTIMICROBIAL AGENTS

SHAHIDA P. AHMED, RAFEEQ ALAM KHAN, BAQIR SHAYUM*
AND FAUZIA HASSAN*

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

ABSTRACT:

Urinary tract infections are UTIs are the most common infection experienced by females particularly causing discomfort in elderly patients. *Klebsilla* and *Proteus* species were common pathogens isolated. The front line antibiotics for treating UTIs to *Klebsilla* and *Proteus* species were found to be ofloxacin, Norfloxacin, ciprofloxacin, cefaclor, cefuroxime and piperidic acid.

INTRODUCTION

Urinary-tract infection is responsible for serious illness and contributes significantly to the cost of health care in economically developing countries. It also leads to a number of deaths either from acute infection or from chronic renal failure. Infections in children are often hard to recognize because of their variable symptomatology and the difficulty of obtaining suitable specimens of urine in the very young, but they are of particular importance as cause of permanent damage to the developing kidney. The incidence of infection is highest in women, 20-50% of whom will suffer a clinical episode during their lifetime; however, most of these infections remain undiagnosed and undergo spontaneous re-infection. Infection is much less common in males, in whom it is specially related to abnormalities of the urinary tract or instrumental interference with it. Infections in domiciliary practice are usually uncomplicated and affect mainly women, the majority of whom are otherwise healthy. In hospital, on the other hand, infections are often complicated, and many are consequences of interference to the free flow of urine or of invasive procedures such as urinary-tract investigation, surgical operation and particularly catheterization. Bacteriological examination of the urine is the major aid to the diagnosis of infection. Clinical symptoms may some times be a good

initial guide to the presence and site of infection, but many infections are symptoms and genital infection may increase infection of urinary tract. Resistant organisms are most often associated with infections acquired in hospitals they tend to be found in patients with complicated urinary-tract infections and may present serious therapeutic difficulties.

Treatment with antibacterial agents may eradicate the infectious organism, but these agents must exhibit maximum activity against the major pathogens. Antibiotic resistance, represents a serious problem for clinicians and great effort is being made to control the resistance. Keeping in view the importance of UTI the present study was undertaken to determine the susceptibility pattern of isolated organisms to different antibiotics.

METHOD

Clinical Isolates:

A total of 200 identified pathogens isolated from UTIs were collected from Sind Govt. Hospital Laboratory and Nazimabad Hospital Laboratory. The organisms were isolated from urine samples and were maintained on nutrient agar. The purity of the culture were checked by Gram's stain and preliminary identification of cultures were made by Brolacin Agar. The identification of the organisms were also done by using Macconkey's agar, Rambac Agar, cetrinide agar and voget-Jhonsons agar.

Antibacterial Susceptibility:

Standard disk diffusion antimicrobial tests (approved by National Committee for clinical laboratory standards) were performed using antibiotics disks including Amoxicillin (Amx 10 ug), ciprofloxacin (cip 5 ug) ciprofloxacin (cip 50 ug), Cefixime (cef 5 ug), cefuroxime Na (cfu 30ug) cephradine (cep 10 ug), cefaclor (cfa 30 ug) cephalothin (cph 30 ug).

RESULTS

A total of 200 identified pathogens (bacteria) collected from different pathological laboratories. The most common pathogen isolated were *Proteus* spp, *Klebsilla* spp. The percentage of resistance was cephalothin 31.0%, cefaclor 20.6%, cephradine 20.6%, cefuroxinc Na 10.3%, cefixime 24.1% with *Klebsilla* spp.

The resistance pattern of nalidixic acid pipedimic acid belonging to quinolone groups were observed and percentage resistance of nalidixic acid on *Klebsiella* spp was 17.3% while the percentage resistance of pipedimic acid was 10.3% respectively. Among fluoroquinolones, norfloxacin and ciprofloxacin were effective 10.3% respectively *Klebsiella* exhibit higher resistance to Ampicillin and Amoxicillin. However *Proteus* spp. are sensitive to both Ampicillin and Amoxicillin.

Percentage of resistance pattern of organisms isolated from urinary tract infections:

Antibiotics	<i>Klebsiella</i> spp.	<i>Proteus</i> spp.
A. Cephalosporins group		
Cephalotjhin	31.0	25
Cefaclor	20.6	0
Cephradine	20.6	0
Cefuroxime (Na)	10.3	0
Cefixime	24.1	0
B. Quinolone and flouroquinolone		
1. Quinolone group		

Nalidixic acid	17.3	10.3
Pipemidic acid	10.3	0
2. Fluroquinolone group		
Norfloxacin	10.3	0
Ofloxacin	3.4	0
Ciprofloxacin	10.3	0
3. Semi-synthetic penicillin		
Ampicilhin	793	25
Amoxycihhin	75.8	25

DISCUSSION

In the present study, two different genera of bacteria were isolated from UTIs in which the percentage of *Klebsiella* spp. recorded was 29%, *Proteus* spp. was 4%.

The study indicated *Escherichia coli* as the commonest organism causing UTIs. This is inconsistent with the results of studies carried out previously in Karachi region (Ahmed S.I. *et al.*, 1975 and Farooqui B.J. *et al.*, 1989). Studies from western countries also indicated *Klebsiella* as the common urinary pathogen (Williams J.D. *et al.*, 1969, Wing A.J., 1970, McAllister *et al.*, 1971, Moore 1973, Senewiratne *et al.*, 1973 and Tiemey *et al.*, 1993).

Proteus spp. were found to be sensitive to all the cephalosporin except Cephalothin.

Fluoroquinolones such as norfloxacin, ofloxacin and ciprofloxacin represent particularly important therapeutic agents, that have much broader spectrum of antimicrobial activity than quinolones. The quinolone used in the present study includes nalidixic acid and pipemidic acid quinolones have broad antimicrobial spectrum covering all aerobic Gram negative and Gram positive bacteria encountered in UTIs (Nielsen *et al.*, 1989).

Ball *et al* (1986) considered ciprofloxacin a very useful therapeutic agent for acute urinary tract infections (UTIs).

Resistance of UTI pathogens is rapidly increasing to cotrimoxazole. The report of Ahmad *et al* (1975) indicated it a drug of choice for treating UTI. Farooqui *et al.*

(1989), reported an increase in co-trimoxazole resistance from 13% to 60% in the present study the resistance further increased to 75% thus making it unsuitable as front line antibiotic in UTI infection.

As far as combined therapy is concerned their effectiveness is not superior to a single antimicrobial agent. Since none of the case was that of mixed infection the use of combined therapy is not desirable. Finally, the study points to the need of frequent monitoring of bacterial spectrum and their sensitivity pattern in UTI so that blind and indiscriminate use of antibiotic therapy could be checked which may lead to an increase in resistant pathogenic population. It is also stressed that urinary tract infections should be carefully investigated with respect to etiological agent and its antibiotic sensitivity pattern so as to achieve the prime goal of successful management.

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