

# COMPARISON OF AZTREONAM AGAINST OTHER ANTIBIOTICS USED IN URINARY TRACT INFECTIONS

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**Background:** Urinary tract infection is a very common problem in adults as well as in children. There is always need for the right antibiotic to be chosen for treatment. **Methods:** This study was conducted at Microbiology section in Pathology department of Ayub Medical College, Abbottabad, Pakistan. In this study the aztreonam which is only effective against gram negative bacilli has been compared with other conventionally used antibiotics, ampicillin, cotrimoxazole, minocycline, pipemedic acid, nalidixic acid, norfloxacin, ciprofloxacin, gentamicin and ceftriaxone. **Results:** Total gram negative isolates were 342. Out of this 76.6% (262) were E.coli. Klebsiella pneumoniae 14.3% (49), proteus species 5.2% (18) and pseudomonas aeruginosa were 3.8% (13). The aztreonam showed 78% sensitivity against gram negative bacilli which is better than norfloxacin which showed 62.2% sensitivity.

## INTRODUCTION

Urinary tract infection (UTI) is one of the common infections in the indoor as well as outdoor patients. UTI can range from minimal disease to a life threatening sepsis. The minimal disease usually involves lower urinary tract infection but if it is not treated properly in time it invariably involves upper urinary tract. Treatment can be very simple short course chemotherapy or it can lead to complicated disease where it becomes difficult to eradicate the infection | Identification of the causative organism and susceptibility to antimicrobials is highly important, so that proper drug is chosen to treat the patient in early stages<sup>3</sup>.

Starting as simple bacteriuria the urinary tract infection can lead to complicated upper urinary tract infection and life threatening septicemia. To choose the right drug at right time is very necessary to cure the patient from such a serious disease.

## MATERIAL AND METHODS

This study was done on 342 gram negative isolates at the Microbiology laboratory of Pathology department, Ayub Medical College, Abbottabad, Pakistan. All the patients were received as out patients. Five mm diameter wire loop was used for inoculation. Blood agar and MacConky agar was used, twenty colonies or more was taken as positive growth. API 20E was used for bacterial identification. Sensitivity discs applied and zone of inhibition noted. Partially resistance stains were counted as resistant in this study.

## RESULTS

The results of this study are summarized in tables 1-6.

## DISCUSSION

In this study all the conventional drugs used in urinary tract infections were studied. The aztreonam which is available in injectable form only is not very commonly used in routine practice. The sensitivity pattern against aztreonam showed very good results. The ceftriaxone which showed best results was only 75% sensitive whereas aztreonam was sensitive against 78% of gram negative bacilli.

In E.coli infections our results were almost equal to ceftriaxone but better than norfloxacin and pipemedic acid. The Klebsiella species proved to be showing even better results with aztreonam For proteus species the results were better than norfloxacin. The aztreonam had also very good results against pseudomonas, although in our study ciprofloxacin was better than any other drug against pseudomonas. In various other studies aztreonam showed good results in urinary tract infections<sup>7,10</sup>.

In our study 13 cases were only sensitive to aztreonam and resistant to all rest of the drugs. We could follow 5 cases that received treatment with aztreonam with full recovery from the disease.

In conclusion it is suggested that aztreonam may be routinely used in sensitivity testing against gram negative bacilli isolated from urine or at least it should be included in extended sensitivity testing.

**Table -1: Species type out of 342 grams' negative isolates from urine**

E. Coli 76.6% (262)	Klebsiella Pneumoniae 14.3% (39)	Protesous 5.2 % (18)	Pseudomonas Aeruginosa 3.8 (13)
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**Table-2: Sensitivity results of Cram Negative Isolates from urine.**

pattern	Amp	Cotri	Mine	NA	Nor	Pipe	Cipro	Genta	Ceftri	Aztreonam
<b>Sensitivity</b>	37.9% (125)	34.9% (115)	43.5% (149)	56.1% (192)	69.2% (257)	64.3% (220)	72.8% (249)	56.1% (194)	75.4% (258)	78% (268)
<b>Resistant</b>	62.0% (204)	65.0% (214)	56.4% (193)	43.8% (150)	30.7% (105)	35.6% (122)	27.1% (43)	43.2% (148)	24.5% (84)	22% (74)

**Key Terms:** Amp: Ampicillin, Cotri: Cotrimoxazole, Mine: Minocycline, NA: Nalidize, NOR: Norfloxacin. Pipe: Pipemedic Acid. Cipro: Ciprofloxacin, Genta: Gentamycin, Ceftri: Ceftraixime (Recephin) & AZT: Aztreonam

**Table-3: Sensitivity of 262 E. coli strains isolated from urine.**

Pattern	Amp	Cotri	Mino	NA	Nor	Pipe	Cipro	Genta	Ceftri	Azt.
Sensitive	43.5% (114)	38.9% (102)	44.2% (116)	59.5% (156)	67.9% (178)	63.7% (167)	70.9% (186)	59.5% (156)	78.6% (206)	76.6% (201)
Resistant	56.4% (148)	61% (160)	55.7% (146)	40.4% (106)	32.0% (84)	36.2% (95)	29.0% (76)	40.4% (106)	21.3% (56)	23.3% (61)

**Key: Amp:** Ampicillin, **Cotri:** Cotrimoxazole, **Mino:** Minocycline, **NA:** Nalidize, **NOR:** Norfloxacin. **Pipe:** Pipemedic Acid. **Cipro:** Ciprofloxacin, **Genta:** Gentamycin, **Ceftri:** Ceftraixime (Recephin) & **AZT:** Aztreonam

**Table-4: Sensitivity pattern of Klebsiella pneumonia responsible for UTI**

Pattern	Amp	Cotri	Mino	NA	Nor	Pipe	Cipro	Genta	Ceftri	Azt
Sensitive	12.4% (6)	12.4% (6)	32.6% (16)	40.8% (20)	77.5% (38)	69.56% (34)	73.4% (36)	49.85 (22)	73.4% (36)	85.7% (42)
Resistant	87.7% (43)	87.7% (43)	67.3% (33)	59.1% (29)	22.4% (11)	30.6% (15)	26.5% (13)	55.1% (27)	26.5% (13)	14.3% (7)

**Key: Amp:** Ampicillin, **Cotri:** Cotrimoxazole, **Mino:** Minocycline, **NA:** Nalidize, **NOR:** Norfloxacin. **Pipe:** Pipemedic Acid. **Cipro:** Ciprofloxacin, **Genta:** Gentamycin, **Ceftri:** Ceftraixime (Recephin) & **AZT:** Aztreonam

**Table-5: Sensitivity pattern of Proteus species isolated from cases of UTI**

Pattern	Amp	Cotri	Mino	NA	Nor	Pipe	Cipro	Genta	Ceftri	Azt
Sensitive	27.7% (5)	38.8% (7)	61.1% (11)	77.7% (14)	77.7% (14)	72.2% (13)	77.7% (14)	50.0% (9)	61.1% (11)	83.3% (15)
Resistant	72.2% (13)	61.1% GO	38.8% (7)	22.2% (4)	22.2% (4)	27.7% (5)	22.2% (4)	50.0% (9)	38.8% (7)	16.7% (3)

**Key: Amp:** Ampicillin, **Cotri:** Cotrimoxazole, **Mino:** Minocycline, **NA:** Nalidize, **NOR:** Norfloxacin. **Pipe:** Pipemedic Acid. **Cipro:** Ciprofloxacin, **Genta:** Gentamycin, **Ceftri:** Ceftraixime (Recephin) & **AZT:** Aztreonam

**Table-6: Sensitivity pattern of Pseudomonas isolated from cases of UTI**

Pattern	Mino.	NA.	Nor.	Pipe	Cipro	Genta	Ceftri	Azt
Sensitive	46.1% (6)	46.1% (6)	53.8% (7)	53.8% (7)	100% (13)	53.8% (7)	69.2% (9)	76.9% (10)
Resistant	53.8% (7)	53.8% (7)	46.1% (6)	46.1% (6)	0% (0)	46.1% (6)	30.7% (4)	23.1 1 (3)

**Key: Amp:** Ampicillin, **Cotri:** Cotrimoxazole, **Mino:** Minocycline, **NA:** Nalidize, **NOR:** Norfloxacin. **Pipe:** Pipemedic Acid. **Cipro:** Ciprofloxacin, **Genta:** Gentamycin, **Ceftri:** Ceftraixime (Recephin) & **AZT:** Aztreonam

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