

# THE ROLE OF AZTREONAM IN THE TREATMENT OF GRAM-NEGATIVE INFECTION\*

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*Gram-negatif infeksiyonu tedavisinde aztreonamın rolü.*

Aztreonam is a novel monocyclic beta-lactam antibiotic with a broad spectrum of activity against *Enterobacteriaceae* and *Pseudomonas aeruginosa*. Beta-lactamase stability is due to <sup>4</sup> $\alpha$ -methyl group; anti-pseudomonal activity is due to the carboxyl group and broad anti-Gram-negative activity is due to the aminothiazole oxime group. The lack of an adjoining ring structure means that aztreonam does not bind to Penicillin Binding Proteins (PBP) of Gram-positive bacteria. Aztreonam is exceptional in its high and almost exclusive binding to PBP 3 of Gram-negative bacteria. It is stable to almost all plasmid-mediated and chromosomal-mediated beta-lactamases and aztreonam is essentially devoid of beta-lactamase induction. Its unique monocyclic structure accounts for the lack of cross-allergenicity with bicyclic beta-lactams.

Comparative susceptibility data of 2447 clinical isolates from the Royal Hollamshire Hospital are shown in the table below.

Table. Comparative susceptibility data of 2447 clinical isolates.

Organism	n	% In-vitro susceptibilities			
		Aztreonam	Gentamicin	Ceftazidime	Piperacillin
<i>E. coli</i>	1578	99.9	98	99	78
<i>Proteus spp.</i>	251	100	99	100	95
<i>Klebsiella spp.</i>	243	97	95	98	78
<i>P. aeruginosa</i>	215	93	94	97	97
<i>Enterobacter spp.</i>	126	98	93	90	89
<i>Serratia spp.</i>	34	100	67	100	64

With the comparable activity of gentamicin, aztreonam has advantages over aminoglycosides such as the absence of nephro- and oto-toxicity and continued activity under anaerobic conditions. Aztreonam may also be superior to third generation cephalosporins with respect to its resistance to hydrolysis by beta-lactamases, emergence of resistance during treatment and the maintenance of colonisation resistance of the gastrointestinal tract by its lack of effect on the protective anaerobic flora. These properties make aztreonam a potentially useful agent in the treatment of serious Gram-negative infections.

\* 2. Ulusal Kemotrepi Kongresinde (1987) verilen konferans özetidir.  
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### **Suggested clinical uses of aztreonam alone**

1. Urinary tract infection.
2. Biliary tract infection.
3. Gonorrhoea.
4. Infections where Gram-negative organisms are identified.

Aztreonam can also be considered for other infections in combination with other suitable antimicrobial agents effective against Gram-positive and/or anaerobic pathogens.

### **Clinical use of aztreonam in combination**

1. Abdominal sepsis.
2. Respiratory tract infection.
3. Septicaemia.
4. Skin and soft tissue infections.
5. Gynaecological infections.

The concluding remarks will be concerned with my personal experience on the clinical use of aztreonam with especial reference to:

1. An open study to confirm the efficacy of tolerability of aztreonam in the treatment of presumed or proven Gram-negative septicæmia in cancer patients.

2. The use of 1 gram aztreonam intra-muscularly in the treatment of gonorrhoea in men and women. A cure rate of 96% was achieved and included the successful treatment of infections due to beta-lactamase producing *N.gonorrhoeae* and patients with pharyngeal involvement.

3. Use of aztreonam in the treatment of infections in urology patients.