Aztreonam

Antibiotic Class:
Monobactam (monocyclic bacterially derived beta-lactam)

Antimicrobial Spectrum:
Gram-negative bacteria: *Pseudomonas aeruginosa, Enterobacteriaceae, Escherichia coli, Haemophilus spp., Proteus mirabilis, Proteus spp., Providencia spp., Salmonella spp., Serratia spp., Shigella spp., and Klebsiella spp.*

Mechanism of Action:
Interferes with bactericidal cell wall synthesis by binding to and inactivating penicillin-binding-proteins. This binding causes the formation of elongation or bacterial filamentation resulting in cell lysis and cell death.

Pharmacodynamics
Aztreonam produces time-dependent killing.

Pharmacokinetics:
Cmax: 255mg/L (after 2g IV dose)
Half-life: 1.7 to 2 hours
Protein binding: 56 to 72%
Volume of distribution: 0.06 L/kg

Adverse Reactions:
Dermatologic: rash(rare)
Gastrointestinal: nausea, vomiting, diarrhea, pseudomembranous colitis (rare), increased liver enzymes, pancytopenia and neutropenia
Dermatologic: painful, injection-site reactions

Dosage:
IV: 500mg, 1gram, 2gram vials for injection

Adult dose: IV/IM: 1-2 g q8h
Systemic or life-threatening infections: 2 g IV/IM q6h
Severe systemic infections: 2g IV q6-8h, maximum of 8g per day
Urinary tract infection: 0.5-1g IV/IM q8-12h

Pediatric dose:
Infants less than 1 week of age: 30 mg/kg q12h
Infants 1 to 4 weeks of age: 30 mg/kg q8h
Infants greater than 1 month of age: 30 mg/kg q6-8h

Disease state based dosing:
Renal failure: CrCl 10-30 mL/min: Normal loading dose, followed by a 50% reduction of the loading dose given at the same frequency of normal patients

CrCl less than 10 mL/min: Normal loading dose, followed by a 75% reduction of the loading dose given at the same frequency of normal patients

Hepatic failure: No dosing changes recommended at this time.

Dosing during Continuous Renal Replacement Therapy

CVVH (Continuous venovenous hemofiltration): 1-2g IV q12h
CVVHD (Continuous venovenous hemodialysis): 2g IV q12h
CVVHDF (Continuous venovenous hemodiafiltration) 2g IV q12h
Note: CVVH is mainly for fluid removal alone. Many institutions will employ more CVVHD or CVVHDF which combine dialysis with fluid removal.

Contraindications/Warnings/Precautions:

Precautions: extremely low birth-weight infants or infants with congenital/acquired arginase deficiency; use aztreonam arginate with caution
Warnings: Although cross-reactivity with penicillins and cephalosporins is exceedingly rare, ceftazidime and aztreonam share a common side-chain. For this reason, use caution in administering aztreonam in patients who endorse a ceftazidime allergy.

Drug Interactions:

No clinically significant drug interactions have been identified.

Pregnancy Risk Factor:

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Monitoring parameters:

Therapeutic: Culture and sensitivities, serum levels, signs and symptoms of infection (e.g. fever, WBC)

Brand names/Manufacturer:

- AZACTAM (Bristol-Myers Squibb – AUSTRALIA, FRANCE, ITALY, USA, SPAIN, UK, IRELAND, SWEDEN, SWITZERLAND, BELGIUM, NORWAY, AUSTRIA, GERMANY, DENMARK, PORTUGAL, BRAZIL, HONG KONG, ISRAEL, SINGAPORE, FINLAND, SOUTH AFRICA, NEW ZEALAND, GREECE, CHILE, CZECH REPUBLIC, JAPAN, THAILAND)
- AZTREOTIC (Kleva - GREECE)
- MONOBAC (Bristol-Myers Squibb - MEXICO)
- PRIMBACTAM (Menarini - ITALY)
- UROBACTAM (Bristol-Myers - SPAIN)