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meropenem (mer-oh-pen-e-m)  

Classification  
Therapeutic: anti-infection  
Pharmacologic: carbapenems

Pregnancy Category B

Indications  
Treatment of: intra-abdominal infections, bacterial meningitis, skin and skin structure infections.  
Unlabeled Use: febrile neutropenia. hospital-acquired pneumonias and sepsis.

Action  
Binds to bacterial cell wall, resulting in cell death. Meropenem resists the actions of many enzymes that degrade most other penicillins and penicillin-like anti-infectives.

Therapeutic Effects: Bactericidal action against susceptible bacteria.

Spec-trum: Active against the following gram-positive organisms: Staphylococcus aureus, Streptococcus pneumoniae, Viridans group streptococci, Enterococcus faecalis. Also active against the following gram-negative pathogens: Escherichia coli, Haemophilus influenzae, Klebsiella pneumoniae, Neisseria meningitidis, Pseudomonas aeruginosa, Proteus mirabilis. Active against the following anaerobes: Bacteroides fragilis, Bacteroides fragilis group, Peptostreptococcus species.

Pharmacokinetics  
Absorption: F administration results in complete bioavailability.  
Distribution: Widely distributed into body tissues and fluids; enters CSF when meninges are inflamed.

Metabolism and Excretion: 50–75% excreted unchanged by the kidneys.  
Half-life: Premature neonates: 3 hr; Term neonates: 2 hr; Infants 3 mo–2 yr: 1.4 hr; Children: 2 yr and Adults: 1 hr (in renal impairment).

TIME/ACTION PROFILE (blood levels)  

ROUTE ONSET PEAK DURATION
IV rapid end of infusion 8 hr

Contraindications/Precautions  
Contraindicated in: hypersensitivity to meropenem or imipenem. Serum sickness-like reactions in other beta-lactams (penicillins or cephalosporins, cross-sensitivity may occur).

Use Caution: in: Renal impairment (risk of dizziness and seizures; dose reduction recommended if CrCl < 50 mL/min). History of seizures, brain lesions, or meningitis. Olf: Lactation. Pedi: Pregnancy, lactation, or children < 1 mo (safety not established).

Adverse Reactions/Side Effects  
CNS: Seizures, dizziness, headache.  
Resp: Apnea.  
GI: Pseudomembranous colitis, constipation, diarrhea, glossitis, nausea, vomiting.  
Derm: Moniliasis (children only), pruritus, rash.  
Local: Inflammation at injection site, phlebitis.  
Neuro: Paresthesias.  
Misc: Allergic reactions including anaphylaxis.

Interactions  
Drug-Drug: Probenecid increases renal excretion and increases blood levels (administration not recommended). May increase serum valproate levels (risk of seizures).

Route/Dosage  
IV (Adults): 0.5–1 g q 8 hr. Meningitis—2 g q 8 hr.
IV (Children 3 mo–12 yr): Intra-abdominal infections—20 mg/kg q 8 hr; meningitis—40 mg/kg q 8 hr (maximum 2 g q 8 hr).
IV (Neonates <7 days): 20 mg/kg/dose q 12 hr. Neonates <7 days, 200–2000 g—20 mg/kg/dose q 12 hr. Neonates <7 days, >2000 g—20 mg/kg/dose q 24 hr.
Renal Impairment  
IV (Adults): 0.5–1 g 4–5 mL/min—1 g 12 hr; GO 20–25 mL/min—500 mg q 12 hr; GO >30 mL/min—500 mg q 24 hr.

NURSING IMPLICATIONS  
Assessment  
● Assess for infection (vital signs; appearance of wound, sputum, urine, and stool; WBC) at beginning of and throughout therapy.  
● Obtain a history before initiating therapy to determine previous use of and reactions to penicillins. Persons with a negative history of penicillin sensitivity may still have an allergic response.

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Obtain specimens for culture and sensitivity prior to initiating therapy. First dose may be given before receiving results.

Observe for signs and symptoms of anaphylaxis (rash, pruritus, laryngeal edema, wheezing). Discontinue the drug and notify physician immediately if these symptoms occur. Have epinephrine, an antihistamine, and resuscitative equipment close by in the event of an anaphylactic reaction.

Assess injection site for phlebitis, pain, and swelling periodically during administration.

Lab Test Considerations: Monitor hematologic, hepatic, and renal functions periodically during therapy.

BUN, AST, ALT, LDH; serum alkaline phosphatase, bilirubin, and creatinine may be transiently increased.

Hemoglobin and hematocrit concentrations may be decreased.

May cause positive direct or indirect Coombs’ test.

Potential Nursing Diagnoses

Risk for infection (Indications) (Side Effects)

Deficient knowledge, related to medication regimen (Patient/Family Teaching)

Implementation

IV Administration

Direct IV: Reconstitute 500-mg and 1-g vials with 10 mL and 20 mL, respectively, of sterile water for injection, 0.9% NaCl, or D5W. Vials reconstituted with sterile water for injection are stable for 2 hr at room temperature and 12 hr if refrigerated; if reconstituted with 0.9% NaCl, stable for 2 hr at room temperature and 18 hr if refrigerated; if reconstituted with D5W, stable for 1 hr at room temperature and 8 hr if refrigerated. Concentration: 50 mg/mL. Rate: Administer over 3–5 min.

Intermittent Infusion: Reconstitute 500-mg and 1-g vials with 10 mL and 20 mL, respectively, of sterile water for injection, 0.9% NaCl, or D5W. Different: Further dilute in 0.3% NaCl or D5W to achieve concentration below. Infusions further diluted in D5W are stable for 1 hr at room temperature and 24 hr if refrigerated. Concentration: Final concentration should be 1–20 mg/mL. Rate: Infuse over 15–30 min.

Y-Site Compatibility: alemtuzumab, aminophylline, anidulafungin, argatroban, atropine, azithromycin, bivalirudin, bleomycin, carboplatin, carmustine, caspofungin, cisplatin, cyclophosphamide, cyclosporine, cytarabine, dactinomycin, daptomycin, dexamethasone, dexmedetomidine, dextran 70, digoxin, diphenhydramine, doxorubicin, doxycycline, epidural, epinephrine, enalaprilat, etoposide, etoposide phosphate, foscarnet, furosemide, ganciclovir, heparin, hetastarch, hydromorphone, ifosfamide, insulin, irinotecan, leucovorin calcium, leuprolide, linezolid, lorazepam, lornoxicam, morphine, norepinephrine, octreotide, oxaliplatin, oxycodone, pemetrexed, phenobarbital, potassium acetate, potassium chloride, piperacillin, potassium iodide, propofol, promethazine, prinomastat, procainamide, propranolol, povidone, prradiate, quinupristin/dalfopristin, ranitidine, remifentanil, ropivacaine, rocuronium, succinylcholine, teniposide, thiopental, trimedol, tirofiban, vancomycin, vasopressin, vecuronium, vinblastine, vincristine, vinorelbine, voriconazole, zoledronic acid.

Y-Site Incompatibility: amphotericin B colloidal, amphotericin B lipid complex, amphotericin B lipid complex, amsacrine, amsacrine H lipol complex, amphotericin B liposome, amsacrine H lipol complex, amsacrine H lipol complex, anidulafungin, argatroban, atropine, azithromycin, bivalirudin, bleomycin, carboplatin, carmustine, caspofungin, cisplatin, cyclophosphamide, cyclosporine, cytarabine, dactinomycin, daptomycin, dexamethasone, dexmedetomidine, dextran 70, digoxin, diphenhydramine, doxorubicin, doxycycline, epidural, epinephrine, enalaprilat, etoposide, etoposide phosphate, foscarnet, furosemide, ganciclovir, heparin, hetastarch, hydromorphone, ifosfamide, insulin, irinotecan, leucovorin calcium, leuprolide, linezolid, lorazepam, lornoxicam, morphine, norepinephrine, octreotide, oxaliplatin, oxycodone, pemetrexed, phenobarbital, potassium acetate, potassium chloride, piperacillin, potassium iodide, propofol, promethazine, prinomastat, procainamide, propranolol, povidone, povidone, prradiate, quinupristin/dalfopristin, ranitidine, remifentanil, ropivacaine, rocuronium, succinylcholine, teniposide, thiopental, trimedol, tirofiban, vancomycin, vasopressin, vecuronium, vinblastine, vincristine, vinorelbine, voriconazole, zoledronic acid.

Patient/Family Teaching

Advise patient to report the signs of superinfection (black, furry overgrowth on the tongue; vaginal itching or discharge; loose or foul-smelling stools) and allergy.

May cause dizziness. Caution patient to avoid driving or other activities requiring alertness until response to drug is known.

Caution patient to notify health care professional if fever and diarrhea occur, especially if stool contains blood, pus, or mucus. Advise patient not to treat diarrhea without consulting health care professional. May occur up to several weeks after discontinuation of medication.

Advise patient to notify health care professional of all Rx or OTC medications, vitamins, or herbal products being taken and to consult with health care professional before taking other medications.

Evaluation/Desired Outcomes

Resolution of the signs and symptoms of infection. Length of time for complete resolution depends on the organism and site of infection.

Why was this drug prescribed for your patient?