Cephalosporins

Cephalosporins are beta-lactam antibiotics with similar action to penicillin and are a widely used group of antibiotics. They often begin with “cef-” and are bactericidal through their effects on the cell wall. Cephalosporins are effective against gram positive and negative infections. There are five generations of these drugs, which successively lead to increased gram negative activity, as well as improved ability to reach CSF. Cephalosporins are primarily administered IV due to poor GI absorption. Common side effects include allergic reactions such as rash or anaphylaxis, and thrombophlebitis. Cefotetan, a second generation antibiotic, can also cause excess bleeding which should be monitored for. Cephalosporins are cleared renally, and so should be used carefully in patients with renal impairment. Other considerations are to avoid IV calcium when giving ceftriaxone, and avoid alcohol use when on cefotetan.



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Starts with "Cef-"
Chef Contestants
Most of the drugs in this class start with “cef-,” except for a few such as the first one on the market known as cephalexin (Keflex).

Mechanism of Action

Bactericidal
Bacteria-sliders
Unlike bacteriostatic agents, which simply stop bacteria from reproducing, bactericidal agents actually cause bacterial cell death. They disrupt cell wall synthesis leading to cell wall damage, causing lysis and death.

Indications

Gram-Positive and Gram-Negative Infections
Graham-cracker Positive-angel and Graham-cracker Negative-devil
First-generation cephalosporins are primarily used to fight against gram positive infections, while successive generations have enhanced activity in treating gram negative infections.

Side Effects

Allergic Reactions
Allergy-alligator Reaction
Allergic reactions are the most frequent adverse events occurring with the use of cephalosporins. The most common symptom is a maculopapular rash that develops several days after the onset of use. If signs of allergy appear such as a rash, hypotension, urticaria, or difficulty breathing, the use of cephalosporins should be discontinued.

Thrombophlebitis
Trombone-flamingo
Thrombophlebitis can occur during IV infusion. Minimize its occurrence by rotating the infusion site and administering the IV medication slowly.

Bleeding
Bleeding
The cephalosporin, cefotetan, may cause bleeding tendencies due to reduction of prothrombin levels. Implement caution when using concurrently with anticoagulants or thrombolytic agents and monitor for signs of bleeding.

Contraindications

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Renal Impairment

Dead Kidney

Cephalosporins are eliminated by the kidneys; therefore, individuals with preexisting renal impairment should not be given this drug or dosages must be reduced in order to prevent accumulation of toxic levels.

Considerations

Avoid IV Calcium with Ceftriaxone

Calcium-cow with IV and Chef-tri-axes

The combination of calcium with the cephalosporin ceftriaxone can form potentially fatal precipitates; therefore, the two should never be given together by the same route and should not be reconstituted with solutions containing one or the other. In neonates, the combination has caused death from depositing precipitates in the lungs and kidneys.

No Alcohol

No Alcohol Sign

The cephalosporin cefotetan can induce a state of alcohol intolerance. The patient should be instructed to not have any form of alcohol when taking this medication as their concurrent use could cause a disulfiram-like reaction (flushing of the face, headache, nausea, vomiting, chest pain, weakness, blurred vision, mental confusion, sweating, choking, breathing difficulty, low blood pressure, and anxiety).

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