Cefazolin

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- Plasma concentration of prophylactic cefazolin best correlates with lean body mass measured by bioimpedance analysis in lumbar spine surgery: Results of a pilot study

Cefazolin (INN), also known as cefazoline or cephazolin is an antibiotic, is a first-generation cephalosporin antibiotic. Cephalosporins fall into the category of β-Lactam (beta-lactam) antibiotics. Other antibiotics that fall into this category are penicillin derivatives, monobactams and carbapenems.

Indications

Useful for the treatment of a number of bacterial infections.

This group of antibiotics works by inhibiting cell wall synthesis of the bacteria by binding to penicillin-binding proteins. These groups of antibiotics are known as bactericidal, meaning that they kill the targeted bacteria (as opposed to inhibiting reproduction as bacteriostatic antibiotics do).

The drug is usually administered by either intramuscular injection (injection into a large muscle) or intravenous infusion (intravenous fluid into a vein). It is on the World Health Organization's List of Essential Medicines, a list of the most important medication needed in a basic health system.

Dosification

The typical dosage ranges from 1 to 2 grams every 8 to 12 hours for adults, depending on the severity of the infection. The dosage may be adjusted for individuals with renal impairment.

The 2 g IV dose is considered a high dose and is typically only used for certain types of surgeries, such as orthopedic, cardiac, or open abdominal surgeries, where the risk of infection is considered high.

Cefazolin in Neurosurgery

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A combination of prophylactic cefazolin and vancomycin is associated with decreased risk for SSI [1].

A study aimed to determine the association between measures of body composition and the concentration of plasma and paraspinal muscle cefazolin. Secondly, we aimed to confirm the efficacy of our hospital dosing regimen in achieving the minimum inhibitory concentration (MIC) at the surgical site. Patients undergoing posterior-based lumbar spine surgery had body composition analyzed using bioimpedance analysis. All received 2 g of cefazolin at anesthetic induction in line with hospital guidelines. Cefazolin concentration was measured in plasma (30 minutes) and muscle (30- and 60 minutes) using high-performance liquid chromatography. 20 patients were recruited (mean age 61.5 years; 12 female). Mean plasma cefazolin concentrations were 34.1 +/- 10.2 mg/L; mean muscle concentrations were 44.4 +/- 18.6 mg/kg and 43.8 +/- 20.4 mg/kg at 30- and 60 minutes respectively. Univariate analysis showed a significant correlation between plasma cefazolin concentration and lean mass weight, absolute body weight, height, dry lean mass, total water, total body water, and extracellular and intracellular water volume. Linear regression analysis showed lean mass weight as the best predictor of plasma cefazolin concentration. Muscle cefazolin concentration was dependent on the plasma concentration. Using a MIC of 2 mg/L and 2 mg/kg for Staphylococcus aureus, MIC was achieved in all samples. In summary, plasma cefazolin concentration was best predicted by lean body mass. Further work should consider the influence of body composition on antibiotic delivery in extremes of body mass index. Local hospital guidelines are effective at achieving MIC against S. aureus [2]

Pediatric perioperative prophylactic antibiotics have been recommended as follows: application of cephazolin(30 mg/kg)with a redosing interval of 3 h intraoperatively and continuation for 48 h or less postoperatively. However, even for shunt surgery, there are currently no evidence-based protocols regarding specific antibiotic recommendations or the duration of prophylactic antibiotics [3].

1)
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