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Cefazolin in dog: preliminary results for pharmacokinetic and pharmacodynamic parameters.

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Abstract

Cefazolin, a first generation cephalosporin, is commonly used in small animal surgery to avoid post-operative infections. The aims of the study were 1) assess cefazolin pharmacokinetics (PK) in dogs undergoing gonadectomy, 2) correlate PK and pharmacodynamics (PD) parameters and 3) attest the efficacy of dosage regimen through a PK/PD approach. Thirty minutes before surgery, 25 mg/kg of cefazolin were administered intravenously (IV) to 9 dogs (weight 22±7.5 kg; age 1.3±0.7 years). Blood samples were taken at prefixed times from 0 to 8 h. Quantification of cefazolin concentrations was performed through a validated HPLC method with UV detection (Kunicki, 2012). A two-compartmental model best described the PK profile of cefazolin. Literature MIC₅₀ against canine *Pasteurella* spp., *Staphylococcus* spp. and *Streptococcus* spp. ranged from 0.25 to 0.5 µg/mL (Goldstein, 2012). Distribution and elimination half-lives were 0.3 ± 0.2 h and 3 ± 1.6 h, respectively; area under the curve was 182.3±50.6 h*µg/mL; volume of distribution and clearance at steady state were 383.5±58.1 mL/kg and 150.2±49.8 mL/h/kg, respectively. The PK/PD index for cephalosporins efficacy is time above MIC (T>MIC) for 60% of dosing interval with values 4 times higher than the MIC₅₀. Our values of T>MIC, calculated with MIC 0.5 mg/mL, was for 100 % of the observation period from 2 to 6 times higher than MIC. Preliminary results showed a good efficacy of cefazolin against all the bacterial strains evaluated. Therefore, a dosage regimen of 25 mg/kg IV every 8h might represent a valid tool in order to prevent surgical infections in small animal practice.

References

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