PHARMACOKINETICS OF A SINGLE ORAL DOSE OF FLUNIXIN MEGLUMINE IN THE WHITE RHINOCEROS (*Ceratotherium simum*)

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Abstract

Appropriate analgesia for colic, lameness, osteoarthritis management, and other medical conditions in white rhinoceroses (*Ceratotherium simum*) is critical. Flunixin meglumine is one of the most common non-steroidal anti-inflammatories used for analgesia in megavertebrates but its pharmacokinetics in rhinoceroses have not been published.[2] Due to this lack of data, equine pharmacokinetic and pharmacodynamic data are commonly used for dosing rhinoceroses. However, there are dangers in extrapolating drug doses when limited species-specific pharmacokinetic information exists.[1,3] Adult white rhinoceroses (n = 5) were administered flunixin meglumine[a] (1 mg/kg, p.o.). Blood samples were collected from each animal at pre-determined time points after drug administration. Plasma flunixin and 5-OH flunixin concentrations were determined, and pharmacokinetic analysis was performed using industry standard software.[b] Mean maximum plasma concentrations (C_{max}) of 1207 ± 601 ng/ml were reached at an average of 3 hr. The geometric mean apparent elimination half-life was approximately 8.3 h ± 1.2 hr. Phase I metabolite 5-hydroxy flunixin concentrations averaged 10% of flunixin concentration for most of the time points. These data demonstrate important differences in drug disposition from horses: one study reported mean C_{max} of 2500 ng/ml, which is approximately twice the concentrations found in this study, and an apparent elimination half-life of 1.5 hr, which is considerably shorter than estimated in this study.[4] Our results support that oral flunixin meglumine (1 mg/kg) may provide therapeutic drug concentrations in white rhinoceroses based on efficacy data in other species.[5] Further studies are necessary to investigate long-term safety and efficacy after multiple doses of flunixin meglumine in this species.

[a]Banamine Paste, Merck Animal Health
[b]Phoenix WinNonLin, Certera USA, Inc.

Key words: *Ceratotherium simum*, flunixin meglumine, pharmacokinetics, white rhinoceros

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