PLASMA CONCENTRATIONS AND CLINICAL EFFECTS OF BUTORPHANOL-AZAPERONE FOR STANDING SEDATION OF SOUTHERN WHITE RHINOCEROS (*Ceratotherium simum simum*)

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Abstract

Despite the risks associated with immobilization of rhinoceros, there are no published pharmacokinetic studies on chemical immobilizing agents in any rhinoceros species. Standing sedation in rhinoceros is necessary for various clinical procedures, such as artificial insemination and other reproductive techniques. Butorphanol and azaperone have been described for sedation in rhinoceros species, but administration has resulted in varying degrees of sedation, including recumbency.[1,2] This study evaluated the plasma concentrations, pharmacokinetics, and clinical sedative effects of butorphanol and azaperone in southern white rhinoceros (*Ceratotherium simum simum*). Standing sedation (n = 8) was performed in southern white rhinoceroses (n = 3) using a combination of butorphanol (mean 25.3 µg/kg; range 22-30 µg/kg) and azaperone (mean 25.9 µg/kg; range 20-30 µg/kg) injected intramuscularly with blood collection at opportunistic time points approximately every 10 min. Standing sedation was achieved for 73.5 min (mean) (range 58-99 min). Plasma concentration of butorphanol ranged from 0.62 to 3.96 ng/ml, and azaperone ranged from 0.69 ng/ml to 28.29 ng/ml. Video evaluated by two reviewers using a novel quantitative scoring system was used to assess sedation level and correlate with plasma concentrations. Preliminary pharmacokinetic parameters, including peak plasma concentration and time to peak plasma concentration, for each drug were evaluated. The findings of this study will help guide standing sedation of southern white rhinoceros, as well as provide novel pharmacokinetic and pharmacodynamic data on chemical immobilizing agents.

Key words: Azaperone, butorphanol, *Ceratotherium simum simum*, southern white rhinoceros

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