SEDATION WITH ALFAXALONE AND LOCAL ANALGESIA AS AN ALTERNATIVE TO GENERAL ANESTHESIA IN REPTILE AND AMPHIBIANS

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ABSTRACT

General anesthesia can be challenging in some reptile species. Alfaxalone (Alfaxan, Jurox, NSW, Australia) is an induction agent labeled for dogs and cats that can be administered intramuscularly in many reptiles for short-term, easily administered sedation. When used with a local analgesic agent, this combination can be used for a number of short, minimally invasive procedures, reducing the need for general anesthesia. The author has successfully used sedation with alfaxalone with a local block for the following procedures in reptiles: placement of an IO catheter, local block for removal of biopsy samples, treatment and suturing of minor wounds, and simple amputations, such as of digits or the phallus.

Introduction

The American Society of Anesthesiologists (ASA) defines anesthesia as a pharmacologically induced reversible state of amnesia, analgesia, loss of responsiveness, and loss of skeletal muscle reflexes, or more simply “without sensation”.¹ In contrast, sedation is a “drug induced depression of consciousness during which patients cannot be easily aroused, but responds purposefully following repeated or painful stimulation”. The anesthetized animal achieves a surgical plane of anesthesia, while the sedated patient does not. In some cases, sub-anesthetic dosages of anesthetic agents can be considered functional sedation.

Sedation and local analgesia is an attractive alternative to general anesthesia or simple manual restraint for mild to moderately painful procedures in many exotic species, and is used routinely by some authors in avian and exotic companion mammal patients. A 2005 survey of reptile veterinarians showed that the most commonly utilized agents for anesthesia, sedation and/or analgesia were isoflurane (Isothesia, VetUS, Dublin, OH), ketamine (Ketathesia, Butler Schein, Dublin, OH), propofol (Diprivan, AstraZeneca, Wilmington, DE) and butorphanol (Torbugesic, Fort Dodge, Fort Dodge, Iowa).² These veterinarians agree that anesthesia is challenging, and respiratory depression, difficulty in measuring anesthetic depth, prolonged recovery and hypothermia were listed as the most common complications. In many cases, reptile recoveries from general anesthesia can be prolonged, and it is not uncommon to experience a delay of many hours before the return of spontaneous breathing and movement. Ventilation must be provided throughout the procedure and into recovery. For these reasons, and for perceived reasons of improved safety, sedation and local analgesia as an alternative to general anesthesia may be of benefit in reptile patients.
Alfaxalone

The author and others have experience with the use of alfaxalone in reptiles in clinical practice.\textsuperscript{2,3} Alfaxalone is an injectable anesthetic agent used for induction and maintenance of anesthesia in dogs and cats. The drug is available in Australia, and the UK, and is expected to be available in the United States in summer/fall 2013. The active molecule binds to GABA cell surface receptors. The plasma elimination half-life is approximately 25 min in dogs and 45 min in cats. Alfaxalone is completely cleared within a few hours after single intravenous dosing in these species, and is metabolized by the liver.

The motivation for use of alfaxalone are two fold: frustration with the array of drugs currently recommend for IM use in reptiles available in the United States, and technical difficulties associated with reliable intravenous administration.\textsuperscript{5} Alfaxalone is extremely useful for deep sedation or induction followed by immediate intubation and maintenance with an inhalant anesthetic. As an alternative, alfaxalone can be combined with local analgesia for brief, minor procedures. It should be noted that even when combined with pre-medications, alfaxalone administered IM does not appear to achieve an acceptable surgical plane of anesthesia, and is therefore inappropriate for painful procedures without the addition of analgesic agents. Duration of action is variable but in general brief, often no more than 15 min. Full recovery is usually within 1 hr. When combined with other agents such as midazolam and butorphanol, recovery is significantly longer. Experience has revealed the following trends (it should be kept in mind significantly higher case volumes, and clinical research are required to support the following conclusions): Dosages ranges are 5-25 mg/kg. Ill or debilitated patients require significantly less drug than fractious, more stable patients. Dosages required appear to be higher in chelonians and green iguanas, and lower in snakes and leopard geckos. The author always begins with the lower end of the dosage range (5-10 mg/kg), adding boluses as needed to effect. The author experienced a single fatality associated with the use of alfaxalone in a green tree frog, but has since used it successfully in an American bullfrog.

Local Anesthetics

Analgesic studies in reptiles are few and often contradictory. Doses of various drugs are suggested, but actual efficacy is uncertain. There are very few reports of the use of local agents in reptiles.\textsuperscript{6} Use of local analgesia in reptiles is anecdotal and extrapolated, likely incorrectly, from other species. There is limited efficacy and toxicity data for any exotic species. Lidocaine and bupivacaine have been used for local infiltration, and regional blocks, including spinal blocks in mammals. Assumption of efficacy in these species is made through reduction of inhalant MAC in patients receiving general anesthesia, and lack of apparent sensation in patients receiving sedation only. The author uses 1-2 mg/kg lidocaine, with or without 1-2 mg/kg bupivacaine in reptiles sedated with alfaxalone. Local anesthesia is evaluated by applying a brief, noxious stimuli to the blocked area (needle prick or pinch), and comparing the reaction to that from a similar stimuli in an unblocked region. Care must be taken when evaluating pain response in reptiles and amphibians. Many un-medicated patients do not respond to obviously painful stimuli when ill or stressed. Toxicity due to administration of local agents has not been recognized in these species.
Conclusion and Discussion

Alfaxalone in combination with a local analgesic (lidocaine/bupivacaine) is an attractive alternative to general anesthesia for select procedures in reptile and amphibian patients. As with any anesthetic, proper patient monitoring and support is still suggested at all times. Based on scientific reports and personal experience, alfaxalone with or without a local anesthetic appears to offer a level of consistent safety and effectiveness, with the added benefit of a more rapid recovery compared with other anesthetic combinations. Considering these potential benefits, further studies to document it’s safety, effective dosing, and effects in various species of reptiles and amphibians should continue to be looked into critically.

LITERATURE CITED