The Use of Propofol in Reptile Anesthesia


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INTRODUCTION

The great advances that have been made in reptile medicine coupled with the increasing reptile pet market have resulted in an growing need to perform successful surgical procedures. All surgical procedures from suturing a simple laceration of the integument to performing major orthopaedic, gastrointestinal or urogenital techniques rely totally on successful anesthesia. The development of isoflurane represented a major breakthrough and there is little doubt that this is now the gaseous anesthetic of choice. The search for an equally safe and effective induction agent has proved more problematical with the majority of modern reptile texts concentrating on the use of dissociative agents (ketamine, tiletamine). This paper describes the use of propofol as an anesthetic agent for use in reptiles.

Propofol, Disoprofol (ICI 35, 868) is a relatively new addition to the veterinary anesthetist's armory of injectable agents. It has a simple aromatic structure and, as an oily compound, must be emulsified to form a white, opaque liquid suitable for intravenous administration.

Propofol is highly lipid soluble and thus produces a rapid onset of anesthesia, typically one vein-brain circulation time according to mammalian studies. In mammals, propofol at equianesthetic doses to thiopentone causes similar degrees of cardiovascular and respiratory depression. Propofol has several important advantages which sets it aside from other injectable agents. It is not painful and perivascular injection does not cause irritation or inflammation. In addition, propofol is readily metabolized and, because recovery does not depend on uptake by muscle or fat, it is non-cumulative and therefore incremental dosing or continuous infusion can be used to maintain anesthesia. The fast rate of metabolism results in a rapid recovery from anesthesia, typically 25-40 min in most reptiles. The quality of the anesthesia produced with propofol is excellent. Induction, maintenance and recovery periods are smooth following a single or incremental doses.

Propofol is compatible with a wide variety of premedicant drugs and inhalation anesthetics. In reptile practice, propofol induction is most likely to be proceeded by maintenance with isoflurane. Propofol is currently produced in the United Kingdom as Rapinovet, 20 ml vials containing 10 mg/ml propofol, by Mallinckrodt Veterinary Ltd. A specific veterinary licensed product is soon to be launched in the UK and US.
Practical reptile anesthesia using propofol

In the author's experience, the dose rates for propofol in un-premedicated reptiles are as follows:

- lizards 10-14 mg/kg i.v.
- snakes 10-12 mg/kg i.v.
- chelonia 12-15 mg/kg i.v.

In snakes premedicated with 10-20 mg/kg metomidate (Hypnodil, Janssen), i.m., 20 min prior to induction, the required dose of propofol was reduced to 5 mg/kg i.v., however the recovery period was prolonged4.

Propofol must be delivered intravenously. The ventral tail vein is preferred in lizards and snakes, although intracardiac injection has been used in small boids without incident. The dorsal tail vein and jugular can be used in chelonia. Intramuscular propofol is rapidly metabolized as it is absorbed from the injection site and therefore blood levels fail to achieve anesthetic planes. Propofol is not viscous and can be easily injected through a 27 ga needle to small reptiles.

Induction times are generally rapid, typically being less than a minute. Some individuals have noted that induction can be prolonged, particularly in chelonia, taking up to 5 min when injected into the dorsal tail vein. This author considers these observations to be due to partial perivascular injection or injection into the lymphatic vessels closely associated with the dorsal tail vein of these species.

Propofol by itself will usually give approximately 15-25 min of surgical anesthesia and restraint, and recovery (return of righting reflexes) usually occurs 25-40 min after injection. This is usually sufficient for minor procedures including tail amputations, skin biopsies, lung washes, endoscopy, radiographs etc. For longer procedures, intubation and maintenance on isoflurane is the usual practice in the UK, although incremental dosing or intravenous infusion have been used by the author on rare occasions.

DISCUSSION

Compared to alphaxalone/alphadolone (Saffan, Mallinckrodt Veterinary Ltd.) and tiletamine/zolazepam (Telazol, Fort Dodge Laboratories), propofol is shorter acting, and although it cannot be given i.m. it is considered by the author to be safer and more appropriate for debilitated patients.

The desirable properties of propofol are rapid, smooth induction, minimal accumulation on repeated injections, relative freedom from excitatory side effects and rapid recovery with little hangover effect3. This gives propofol distinct advantages over the frequently used dissociative anesthetics (ketamine, tiletamine) and makes it the author's induction agent of choice for reptiles.
LITERATURE CITED


