Anesthesia and Analgesia in Birds, Reptiles and Small Mammals

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INTRODUCTION

Anesthesia, definable as the loss of feeling or sensation, is used in veterinary medicine to produce immobilization, analgesia and muscle relaxation in a safe and reversible manner. For some minor procedures, for example blood sampling, simple restraint may be all that is required. For more invasive and painful procedures, or when dealing with potentially dangerous species, general anesthesia must be used. In exotic animals we deal with several thousand different species of 3 different classes, with considerable anatomical, physiological and pharmacological differences, some general guidelines are applicable throughout.

PRE-ANESTHETIC ASSESSMENT & STABILIZATION

A full history should be taken, assessing not only the animal's current and previous health status, but also paying attention to housing and feeding, since many animals illness relate to sub-optimal environmental conditions or nutritional factors. Accurate identification of species (reptiles) is also essential. This may influence the choice of drugs administered and also the required hospitalization facilities. Pre-operative hematology and bloodchemistry should be routinely considered, but may not be possible due to animal size or difficulties associated with venipuncture. For elective procedures (e.g. neutering), underweight, dehydrated or debilitated animals should be nursed until their condition improves.
In reptiles for non-elective surgery attempts to correct dehydration must be started prior to anesthesia. Even the most moribund egg-bound reptile will usually benefit from stabilization for at least 24 hours before starting surgery.
Fasting should be carried out before all elective surgery in order to reduce the chances of regurgitation or in reptiles to reduce compression of lung(s) associated with large meals. In general 1-2 feeding cycles should be skipped (some hours in small mammals, 2-4 weeks for a large constrictor, 1-2 days for an iguana).

ANAESTHESIA REPTILES

In exotic animal medicine the gas anesthesia is well established because it can be closely monitored. Reptiles react well to injectable anesthesia for induction. Anesthetic gas as induction in reptiles is not very effective, physical apnoe may occur because of the odour of the gas. 0.5-1 mg/kg alfaxalon should be applied intravenously as induction. The duration of the drug effect will be approximately 15 minutes. Meanwhile the animal can be intubated and kept under anesthesia using 2-3% Isofluran in oxygen. If injected paravenously the drug will nonetheless affect the animal with a delay. This fact should be kept in mind that after surgery it may come to a rebound effect.
Especially for self-defensive patients or extremely painful surgery ketamin and diazepam or midazolam can be injected for anaesthesia. When injected intramuscular, it takes approximately 1-2 hours until the drug works and the actual effect lasts up to several hours. For reptile patients the anaesthetic system has to be non-rebreathing.

Intubation:
The tube must not be blocked to avoid pressure necrosis of the tracheal mucosa. To seal the tube it can be wrapped with self-adhesive dressing material (e.g. PetFlex by Andover). Uncuffed tracheal tubes for neonates are available down to the size 2,5mm. This will allow the intubation of most reptile species. In some cases endotracheal tubes can be made of rubber feeding tubes or for very small reptiles out of intravenous catheters. Intubation should be performed by inserting the tip of the tracheal tube into the glottis. In reptiles the glottis is located at the base of the tongue and can be easily seen. The mouth should be held open by hand or with gauze bandage. Then the tongue can be easily extended with atraumatic forceps or haemostats or held down with a cotton tip applicator. Once the tube is in place, the airway should be confirmed by gently breathing into the tracheal tube or holding a feather to the end of the tube. After that the tracheal tube should be secured in place with gauze bandage or tape. At last, the patient can be hooked to the equipment.

ANESTHESIA RABBITS

Adequate general anesthesia can be achieved for a short procedure with injectable ketamine (25–50 mg/kg) in combination with a tranquilizer such as xylazine (5–10 mg/kg, IM). The combination of ketamine (10–20 mg/kg, IM) and dexmedetomidine (0.125–0.25 mg/kg, IM) provides adequate anesthesia; approximately ⅓ of the original dose can be repeated if anesthesia needs to be prolonged. Atipamezole can be given IM in equal volume to dexmedetomidine volume for reversal. Also Midazolame in a dosage of 1 mg/kg is very useful and safe to reduce stress and induce anesthesia. For longer procedures Isoflurane anesthesia is very useful, we use it in all our surgery procedures as it is quite safe and good to be monitored.

ANESTHESIA BIRDS

In avian patients we have our own ideology which works for us.
We like to use an open system with Oxygen and Isoflurane to sedate birds for stressful manipulations.
DURATION of anesthesia is a keyfactor – stay below 20 minutes!!!!
Mask versus Tube:

- tube thickness may significantly reduce the volume of air flow
- Mucous plugs

Premedication/Preanesthetic Considerations

Premedication drugs are not routinely used in birds. The advantage of premedication might be neutralised by the stress which is induced while handling the patient.
Preanesthetic fasting is controversial in avian practice – we don‘t do it.
Anticholinergic drugs such as atropine are not routinely administered.