

SEDATION OF PET BIRDS

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Abstract

Sedation of pet birds has become an increasingly popular technique to facilitate common clinical procedures, such as physical examination, blood collection, or radiography. Sedation provides immobilization, reduces vocalization, and attenuates the stress response caused by manual restraint. Midazolam and midazolam-butorphanol are the most commonly used drugs for sedation of pet birds, and they provide dose-dependent sedation with no significant side effects if used at the published dosages. The intranasal route of administration is a noninvasive alternative to intramuscular administration and has been shown to be a safe and effective technique to rapidly induce sedation in pet birds. Reversal with flumazenil should be performed in most cases of midazolam or midazolam-butorphanol induced sedation, in order to achieve rapid and complete recovery. Copyright 2014 Elsevier Inc. All rights reserved.

Key words: butorphanol; flumazenil; intranasal; midazolam; psittacine; sedation

Sedation of dogs and cats in veterinary practice is commonly done to perform a variety of diagnostic procedures, such as radiography and ultrasonography, or other nonpainful but potentially stressful procedures. Historically, for avian patients, either manual restraint of conscious birds or general anesthesia has been done to perform these same clinical procedures.^{1,2} General anesthesia predisposes birds to cardiovascular and respiratory depression and may cause aspiration of gastric or crop contents and hypothermia. By contrast, manual restraint of conscious birds is simple to perform but can have negative consequences, including stressing the bird and/or the handler, negative conditioning to the clinic environment (i.e., the person restraining or the towel used for restraint), hyperthermia, and the predisposition of trauma to the handler and/or the bird. Several recent studies demonstrated that manual restraint of birds causes increased body temperature and respiratory rate.^{3,4} In sick, geriatric, or very stressed avian patients, acute collapse and death secondary to manual restraint have been reported. Therefore, simple sedation techniques provide a useful alternative for reducing physiologic stress in birds undergoing nonpainful clinical procedures. Further, sedation in birds provides easier restraint, increases the safety of many clinical procedures (e.g., blood collection and radiography), and allows for a more complete examination, which would otherwise only be achieved under general anesthesia. Using safe and effective sedation protocols in pet birds provides substantial benefits to the patients and the veterinarian and should be considered for a variety of clinical procedures.

DRUGS

Route of Drug Administration

Historically, drugs used for avian sedation have been administered by intramuscular injection.⁵ Recently, the intranasal administration of sedative

drugs in birds has gained attention.^{4,6-8} Intranasal drug administration offers an alternative, noninvasive technique for sedating avian patients (Table). This drug administration technique is characterized by its ease of administration, high bioavailability, drug absorption, and reduced pain

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TABLE. Comparison of intramuscular and intranasal drug administration in pet birds

	Intramuscular Administration	Intranasal Administration
Pro	Reliable drug delivery Faster administration	Noninvasive Not painful Higher client acceptance Reduced risk of needlestick injury No changes in the biochemical panel
Con	Invasive Potentially painful Possible postinjection hemorrhage Changes in the biochemical panel	Risk of incomplete drug delivery Difficult to administer larger volumes May cause sneezing More difficult in birds with feathered or narrowed nares

when compared with intramuscular administration. Elevation of muscle enzymes in biochemistry panels secondary to intramuscular drug administration is avoided through the intranasal application of the therapeutic agent. Moreover, clients perceive the intranasal route as noninvasive when compared with intramuscular injection, which leads to increased client confidence in cases in which sedation is recommended. The time of onset to sedation is rapid in birds following intranasal drug administration, typically within 3 to 5 minutes.^{4,7,8} Limitations of intranasal administration include incomplete drug delivery (e.g., sneezing during administration), physiologically narrowed nostrils (e.g., cockatoos), or upper respiratory disease (e.g., blocked or stenotic nostrils). In some cases involving larger birds (e.g., macaws), the drug volume can also be a limitation; larger volumes lead to excessive sneezing and consequently incomplete drug delivery. Higher-concentration drugs (e.g., midazolam 50 mg/mL; Zoopharm, Windsor, CO USA) are available, but intramuscular administration might be more feasible in these cases.

Midazolam

Presently, midazolam is the most common drug used for sedation of pet birds and has a wide safety margin.^{5,9} Midazolam has sedative, muscle relaxing, anxiolytic, amnestic, and appetite-stimulating properties in birds.^{4,7,8,10,11} The injectable form of midazolam (midazolam hydrochloride, 5 mg/mL; Hospira Inc, Lake Forest, IL USA) (Fig. 1A) or a more concentrated form (50 mg/mL, Zoopharm) can be administered intranasally and/or intramuscularly without side effects.^{4,6} Dosages of midazolam commonly used in pet birds range from 0.5 to 3 mg/kg.⁵ The author routinely uses 2 mg/kg of midazolam in pet birds, if administered intranasally and as the sole sedative agent.

Diazepam

Although diazepam has a longer duration of action, its therapeutic effects are similar to those of midazolam in birds following intranasal administration.⁸ Diazepam represents a suitable alternative in cases in which midazolam might not be available. The intramuscular administration of diazepam should be avoided because of delayed absorption and muscle irritation.⁵ Dosages for diazepam commonly administered to pet birds range from 0.2 to 2 mg/kg, if used as a sole sedative agent. Dosages of diazepam from 10 to 15 mg/kg have been administered to finches without significant side effects.^{8,12}

Butorphanol

Butorphanol is currently the most commonly used opioid analgesic in birds. Besides its analgesic effects, butorphanol also has sedative effects, which are potentiated by benzodiazepines (e.g., midazolam and diazepam). The combined administration of midazolam and butorphanol is recommended in birds for which midazolam alone provides an insufficient level of sedation or which require deeper sedation for certain clinical procedures (e.g., radiographic positioning).⁶ Butorphanol can be combined with midazolam into a single syringe and administered intramuscularly or intranasally. No side effects of intranasal administration of butorphanol at a dose range of 1 to 3 mg/kg have been reported in psittacines.⁶ The author routinely administers an intranasal or intramuscular combination of butorphanol (1 to 2 mg/kg) with midazolam (1 to 2 mg/kg) to pet birds.

REVERSAL

Reversal of sedation in pet birds depends on the patient and the purpose of the sedation. Sedation

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