Evaluation of Zoletil and other injectable anaesthetics for field sedation of brushtail possums (Trichosurus vulpecula)

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Abstract

Ketamine has been used for many years for sedating possums captured in the wild in New Zealand, but its recent reclassification as a Class III drug under the Misuse of Drugs Act (1975) has made its continued use impractical. Consequently, four other injectable anaesthetic compounds (Zoletil, xylazine-butorphanol, medetomidine-butorphanol and Fentazin) were evaluated as replacements for ketamine. Zoletil (a combination of zolazepam and tiletamine) was the only effective alternative. Brushtail possums (Trichosurus vulpecula) were sedated adequately for general procedures, such as fitting radio-collars, at an intramuscular dose of 5 mg kg⁻¹. At this dose, possums were sedated on average in 3.6 min, and recovery took 65 min on average. Zoletil did not cause sudden arousal as seen with some other anaesthetics, but most possums showed involuntary chewing during recovery, and in some cases excessive salivation. In contrast, Fentazin and combinations of xylazine-butorphanol and medetomidine-butorphanol failed to produce sedation at doses known to be effective in other mammalian species. Zoletil proved similar to ketamine in both performance and cost, and is therefore recommended as a cost-effective anaesthetic and humane method for sedating possums captured in the wild.

Keywords: anaesthetics, animal welfare, brushtail possum, sedation, wildlife capture, Zoletil

Introduction

The brushtail possum (Trichosurus vulpecula), introduced from Australia to New Zealand in 1837 for the establishment of a fur trade, has become a serious pest over large areas of New Zealand due to its impact on indigenous fauna and flora, and its role as a vector of bovine tuberculosis (Montague 2000). Possum populations are researched extensively in the wild to underpin improved management through better understanding of impacts, movements, population dynamics, behaviour, disease transmission, and responses to control. Such work often requires that possums are restrained for purposes such as the attachment of radio-collars, collection of tissue samples, vaccination, or measurement of body parameters. Like most wild animals, possums are not innately docile, and vigorously resist prolonged physical restraint which is considered, therefore, both practically and ethically unacceptable. Rather, anaesthetics are used to sedate the animal so that movement and responsiveness are greatly reduced. Occasionally, researchers have needed to conduct more invasive procedures in the field, such as ovariectomy or castration, where the aims are to simulate potential effects of fertility control methods. Such procedures require induction of surgical anaesthesia where the animal becomes completely unconscious and loses all motor control.

The drug most commonly used to sedate possums was ketamine, but in December 2010 this compound was reclassified as a Class C substance under New Zealand’s Misuse of Drugs Act (1975). The increased stringency of licensing, storage, and auditing requirements posed considerable additional cost and logistical constraints on using ketamine for field research. We therefore evaluated four other drugs used for sedation of mammals (i.e., single substances or combinations of substances) with the aim of identifying at least one that, at an appropriate dose, would provide sedation that was both effective in other mammalian species. Zoletil proved similar to ketamine in both performance and cost, and is therefore recommended as a cost-effective anaesthetic and humane method for sedating possums captured in the wild.