Intranasal Use of Naloxone in Working Canines

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INQUIRY

DHS is looking to set policy for use of the drug naloxone to reverse accidental opioid exposure (signs: walking drunk, vomiting, pinpoint pupils, severe sedation, slowed respiratory rate, slowed heart rate, coma, respiratory arrest) in their working canines. Drug enforcement canines occasionally inhale or contact narcotics and exhibit signs. Naloxone is used by veterinarians in dogs as an extra-label administration, but it is given intravenously (IV) or intramuscularly (IM). What is the group's experience or reference information regarding the use of the intranasal (IN) form of naloxone in dogs?

RESPONSES

From an expert in veterinary anesthesia, analgesia, and pain management we consulted:

I believe there is no data to support the use of intranasal naloxone in dogs. We all know that intranasal medications / vaccines are variably difficult to administer to dogs based on their demeanor. However naloxone is a highly lipophilic drug which likely crosses the nasal mucosa easily to the vascular system. If a law enforcement dog inhales enough of an opioid to be sedated, it likely will allow intranasal administration.

The normal starting dose of naloxone for opioid reversal starts at 0.04 mg/kg IV / intranasal and is reduced as needed. If we consider that most of our dogs law enforcement dogs are 40 kg or less, we can do the same thing for them. (NOTE: 1 spray delivered by IN administration delivers 4 mg of naloxone HCl. Dosage recommendation of 0.04 mg/kg for a 40 kg canine = 1.6 mg.) I would give a dog half to whole dose of the intranasal formulation. I think it is important for all handlers, care providers and associated law enforcement recognize that opioid induce respiratory depression is a human and non-human primate problem. Large doses of opioids in dogs will induce sedation but is unlikely to induce respiratory depression. They may become bradycardic and bradypneic, but their minute ventilation should remain normal due to greater tidal volume.

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I tried it years ago in narcotic detection police canines. Either the label dose of the drug was insufficient for the amount of narcotic exposure or it was not sufficiently absorbed. Once we went back to IM injections only even the low end of the dose range seemed appropriate. We provide first aid kits to K-9 handlers for over 60 agencies and train handlers to give IM and SQ injections. Currently we see on average 2 exposures per year out of the population. Personally I believe IM injection is much easier even for lay person to administer.

Dr. William Grant, II

No specific references in canine except the pre-hospital care guidelines for dogs and cats, which says it is wall absorbed nasally.

http://onlinelibrary.wiley.com/doi/10.1111/vec.12455/abstract

Dr. Jennifer brown

Here is an interesting article as follow-up to the naloxone discussion. Much of the heroin in this country is currently contaminated with fentanyl (or even carfenatil!): https://www.policeone.com/drug-interdiction-narcotics/articles/210352006-DEA-warns-of-Fentanyls-unprecedented-threat-to-cops-K-9s/

Dr. Laura McClain

Am J Vet Res. 1989 Nov;50(11):1854-8.

Naloxone reversal of oxymorphone effects in dogs.

Copland VS[1], Haskins SC, Patz J.

Abstract

Oxymorphone was administered IV to dogs 4 times at 20-minute intervals (total dosage, 1 mg/kg of body weight, IV) on 2 separate occasions. Minute ventilation, mixed-expired carbon dioxide concentration, arterial and mixed-venous pH and blood gas tensions, arterial, central venous, pulmonary arterial, and pulmonary wedge pressures, and cardiac output were measured. Physiologic dead space, base deficit, oxygen transport, and vascular resistance were calculated before and at 5 minutes after the first dose of oxymorphone (0.4 mg/kg) and at 15 minutes after the first and the 3 subsequent doses of oxymorphone (0.2 mg/kg). During 1 of the 2 experiments in each dog, naloxone was administered 20 minutes after the last dose of oxymorphone; during the alternate experiment, naloxone was not administered. In 5 dogs, naloxone was administered IV in titrated dosages (0.005 mg/kg) at 1-minute intervals until the dogs were able to maintain sternal recumbency, and in the other 5 dogs, naloxone was administered IM as a single dose (0.04 mg/kg). Naloxone (0.01 mg/kg, IV or 0.04 mg/kg, IM) transiently reversed most of the effects of oxymorphone. Within 20 to 40 minutes after IV naloxone administration and within 40 to 70 minutes after IM naloxone administration, most variables returned to the approximate values measured before naloxone administration. The effects of oxymorphone outlasted the effects of naloxone; cardiovascular and pulmonary depression and sedation recurred in all dogs. Four hours and 20 minutes after the last dose of oxymorphone, alertness, responsiveness, and coordination improved in all dogs after IM administration of naloxone. Cardiac arrhythmia, hypertension, or excitement was not observed after naloxone administration.