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Case Report

Fatal canine metaldehyde poisoning in Southern Brazil

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Abstract
Metaldehyde is commonly used as a molluscicide, and accidental ingestion in dogs is a recognized toxicologic emergency with potentially fatal outcomes. A 4-month-old female Pit Bull was presented to a veterinary emergency after ingesting an unknown amount of a 5% metaldehyde-based slug bait (Metarex®). Clinical signs began within minutes and included stupor, hypersalivation, and generalized tonic-clonic seizures. Supportive care was provided, including anesthetic coma with propofol and isoflurane, gastric lavage, diazepam, N-acetylcysteine, and oxygen therapy; however, the animal died in eight hours. At necropsy, the stomach and intestines contained abundant blue-to-green amorphous and finely granular material, as well as plastic fragments consistent with Metarex® packaging. No significant microscopic alterations were observed in internal organs. The diagnosis was based on the clinical course, history of exposure, and characteristic gastrointestinal contents. In suspected cases, identification of metaldehyde in the gastrointestinal tract can aid diagnosis when toxicologic confirmation is unavailable.

Keywords: molluscicide, slug bait, acute poisoning.

Introduction

Metaldehyde is a cyclic tetramer of acetaldehyde, widely used as a molluscicide to control terrestrial gastropods (slugs and snails), such as Achatina fulica. Commercial baits are typically formulated as blue-to-green granules or pellets with concentrations ranging from 1.5% to 8% and act by inducing dehydration and the death of mollusks (1, 3, 7). Bran or molasses are sometimes added to the pellets, which increases bait palatability, particularly for dogs (4). In dogs, the estimated oral median lethal dose (LD_{50}) of metaldehyde ranges from 100 to 1000 mg/kg, although a commonly cited value is around 210 mg/kg, based on older experimental studies (1, 3, 7).

The precise mechanism of toxicity in mammals remains unclear. In murine models, it is considered a neurotoxic agent that inhibits neurotransmitters such as serotonin and norepinephrine, and primarily gamma-aminobutyric acid (GABA), leading to increased monoamine oxidase activity, a lowered seizure threshold, and neuronal excitation (5). Metaldehyde poisoning in dogs can be rapidly fatal. Clinical signs usually appear within 30 minutes to 3 hours and include neurological and systemic signs such as convulsion, hypersalivation, tremors, hyperesthesia, seizures, hyperthermia, ataxia, vomiting, metabolic acidosis, tachypnea, dyspnea, hyperventilation, and respiratory depression (1, 5).

There is currently no specific antidote for metaldehyde poisoning, thus the treatment is supportive until the toxin is eliminated (3). Despite early intervention, prognosis remains uncertain in severe cases; and reported survival rates in treated dogs vary: in one study, the survival rate was 81% (5), and in another, 83% (7). This case report describes the clinical progression, pathological findings, and fatal outcome of acute metaldehyde poisoning in a dog from Southern Brazil.

Case description

A 4-month-old female Pit Bull was presented to a veterinary emergency service in Campos Novos, Santa

Catarina, Brazil, shortly after accidental ingestion of a commercial molluscicide containing metaldehyde (Metarex®). The owner found that the dog had torn open the slug bait package and ingested part of its contents; the product and packaging were documented and referred (Fig. 1).

Blue to green amorphous content, residue of metaldehyde pellets, was visibly present in the oral cavity, and the dog exhibited stupor, sialorrhea, and generalized tonic-clonic seizures (S1). Rectal temperature was 37.8 °C, heart rate 165 bpm, respiratory rate 36 breaths per minute, and systolic arterial pressure 140 mmHg. Anesthetic coma was induced using propofol and maintained with isoflurane. Gastric lavage was performed via nasogastric intubation, and the treatment protocol included diazepam (1 mg/kg IV), fluid therapy (60 mL/kg/h), N-acetylcysteine (150 mg/kg IV), omeprazole (1 mg/kg), and oxygen. During the 8 hours of anesthetic coma, the animal experienced progressive cardiovascular and respiratory depression, hypotension, bradycardia, and decreased respiratory rate and body temperature, leading to death.

Macroscopically, the stomach lumen was filled with a large amount of blue to green amorphous and finely granular content (Fig. 2), along with pieces of plastic compatible with the slug bait packet referred by the owner (Fig. 3). Similar content was found in the lumen of all segments of the small intestine (Fig. 4) and the initial portion of the colon. Additionally, there was a focal extensive area of edema and hemorrhage in the subcutaneous tissue of the lateral thoracic region, attributed to prolonged lateral decubitus. No significant microscopic alterations were found in internal organs.

Discussion

This report describes a case of fatal metaldehyde poisoning in a four-month-old Pit Bull, with diagnosis supported by the presence of blue to green amorphous and finely granular gastrointestinal contents and fragments of the commercial molluscicide packaging. The giant African snail (*Achatina fulica*) is a well-known invasive species in Southern Brazil (6), and the use of metaldehyde-based molluscicides is a common control strategy. Although not previously published in the region, cases of metaldehyde poisoning in dogs are not unusual in the clinical routine of small animal practitioners, who are generally aware of this risk.

Although the ingested amount was not precisely measured, the animal had access to a full 200 g package containing 5% metaldehyde (Metarex®) (Fig.1) (7), likely exceeding the lethal dose. Moreover, the difficulty in determining the exact amount ingested has also been highlighted previously (1). Clinical signs in this case were consistent with those previously described (1, 5), including seizures, hypersalivation, and neurologic deterioration. The rapid onset of seizures and death reflects the fulminant course sometimes observed in high-dose exposures (3, 5). No other gross lesions were identified, apart from the blue-to-green content in the gastrointestinal tract, which, together with the clinical history, was sufficient to establish the diagnosis. Nonspecific lesions such as thoracic cavity hemorrhages have been described in other reports (2), but were not observed in this case.

In conclusion, necropsy findings are a valuable diagnostic tool for metaldehyde poisoning in dogs. Identification

Figure 1. A package of metaldehyde-based slug bait (Metarex®) referred by the owner, opened and thorned by the dog. Characteristic blue pellets are visible on the left side.

Figure 2. Dog, metaldehyde poisoning, stomach with abundant blue to green amorphous and finely granular content compatible with digested metaldehyde-based slug bait.

Figure 3. Dog, metaldehyde poisoning, stomach content compatible with the package of metaldehyde-based slug bait (Metarex®) shown in Figure 1.

Figure 4. Dog, metaldehyde poisoning, small intestine with blue to green amorphous and finely granular content compatible with digested metaldehyde-based slug bait.

of bait-like material in gastrointestinal contents can support diagnosis when laboratory confirmation is unavailable.

Supplementary Material

The online version contains supplementary material available at https://doi.org/10.24070/bjvp.1983-0246.019002.

Conflict of Interest

The authors declare no competing interests.

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