Blue Peanut Poisoning (Metaldehyde Intoxication) in a Badger (*Meles meles*).

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Introduction:

This case report details the presentation and treatment of a badger with severe metaldehyde poisoning.

History:

An adult male badger was found in a lay-by and admitted to the RSPCA West Hatch Wildlife Hospital as a suspect road traffic accident (RTA).

On initial examination the badger was found to be in excellent body condition, weighing 15.65kg. The badger appeared bright, alert and responsive. He was placed in a corridor and observed closely. Whilst he had use of all four limbs, he was observed to be hyperaesthetic and slightly ataxic. His condition showed no signs of improving over the following hour and he was therefore anaesthetised to allow a more detailed examination.

General anaesthesia was induced with 40µg/kg medetomidine (Domitor; Pfizer Animal Health), 0.4mg/kg butorphanol (Torbugesic; Fort Dodge Animal Health) and 5mg/kg ketamine (Narketan; Vétoquinol). The badger was intubated with a size 8 endotracheal tube and allowed to breath oxygen at 2l/min. The badger's rectal temperature was 101°F, his mucous membranes were pink and capillary refill time <2s. A pronounced skin tent suggested dehydration and this was corroborated by high packed cell volume (PCV = 54%) and total protein (TP = 99.5g/l) measurements. Chest auscultation and abdominal palpation were unremarkable. A rectal examination revealed blue stained faeces, including large quantities of undigested peanuts.

Bloods were collected for a small mammal profile and intravenous fluid therapy administered. 500ml Hartmans (Aqupharm No11; Animalcare) was administered over a twelve hour period and repeated for a further twelve hours (equivalent to approximately 60ml/kg/day). The colon was then liberally flushed with warm soapy water and a small amount of liquid paraffin in order to remove as much of the material as possible. A stomach tube was then passed into the stomach and 10ml of montmorillonite (Diarsanyl; CEVA) introduced into the stomach. The badger was then

injected with an equal volume of atipamezole (equivalent to 200μg/kg) (Antisedan; Pfizer Ltd) to that of the previously administered medetomidine and allowed to recover.

The badger's condition improved dramatically over the following 48 hours. By day4 there was no evidence of any hyperaesthesia or ataxia. The small mammal profile confirmed a raised haematocrit and hyperproteinaemia reflecting the badger's dehydrated state on admission. There were no other abnormalities (Table 1).

On day5 the badger was re-anaesthetised in order to permanently identify him with an Identichip and tattoo (under licence from English Nature). The badger was released on day13 weighing 16.35kg.

Analysis of the bait material confirmed the presence of metaldehyde at a concentration of 4000mg per kg of bait.

Discussion:

In this particular case the badger was found by the roadside and was therefore presented as an RTA. Such assumptions are easily made. In some cases this assumption will be correct, in others false and in a third group of cases may mask other concurrent problems. A review of the history, taken together with the results of a clinical examination and other observations will help orientate the diagnosis. Displaced individuals with territorial fight wounds are often hit by cars for example: these individual badgers may have been hit as a result of their pre-existing problems. It is therefore important that as accurate a picture as possible, of each individual badger, be constructed. The possibility of concurrent disease, injuries or other conditions should not be overlooked and the author recommends that each casualty be assessed on its merits.

The presence of neurological signs in this badger could have been consistent with head trauma. RTA badgers, with head injuries, may present in various states of consciousness, with or without accompanying neurological signs. The list of possible differential diagnoses would also have included encephalitis of various aetiologies, hypoglycaemia, hepatic encephalopathy, vestibular disease, cerebellar disease, various acquired metabolic disorders and toxicity. The recovery of blue peanuts from this badgers rectum, together with the absence of any obvious signs of a traumatic injury, strongly suggested a toxic cause.

Blue faeces in the badger is not as unusual a finding as one might at first think. There are a number of blue-coloured materials that badgers may ingest and it is important to be aware of them. Many products are coloured to aid identification. Various food dyes are added to rodenticides and pesticides by their manufacturers. There is no universal colouring code however. Rentokil (personal communication) use the colour blue to identify their anticoagulant rodenticides whilst they colour alphachloralose a blue-green. Other manufacturers may use other colour schemes. Slug bait, containing methiocarb or metaldehyde, is also often coloured blue. Blue marker dye is also used in marker sprays and oxytetracycline aerosols (Tetcin; Vétoquinol) and these products are quite commonly found on farms. In addition, badgers are often subject to bait marking exercises. Following studies on hyaenas in the Serengeti in

which they were observed to pass coloured glass Masai beads in their faeces, a technique was developed to help identify badger territorial boundaries (Kruuk 1989). Coloured plastic can be mixed with peanuts and treacle. This bait is highly palatable to badgers and will encourage them to ingest the accompanying indigestible coloured plastic. Use of coloured pellets or beads will help determine which social groups are using which latrines and will allow territorial boundaries to be mapped out (Kruuk 1978; Delahay et al 2000). Different colours are placed at different setts. It is therefore possible that a badger presenting with blue peanuts might have been bait marked. In such a case inspection of the faeces would reveal blue plastic items such as beads or pellets. Local badger groups, as well as researchers at the Central Science Laboratory and other research institutes, commonly use this technique. It is therefore possible that badgers from anywhere in the country may be being bait marked.

When faced with a patient with suspected poisoning, efforts must focus on stabilising the patient and the delivery of symptomatic treatment. Further absorption of the toxicants must be prevented and efforts made to promote their speedy elimination. The axiom, “Treat the patient and not the poison” is often quoted and emphasises the fact that the same basic approach must be taken with most poisons.

In this case fluid therapy was instituted to correct the dehydration. Emesis was not induced because it was deemed impractical in the anaesthetised patient. Gastric lavage was not performed as this is most effective if performed within two hours of ingestion and most of the bait material appeared to be in the lower digestive tract. An enema was therefore administered. Gastrointestinal absorbents were administered by stomach tube to absorb any remaining toxicants in the stomach, small and large intestine. A good response to treatment was obtained. Identification of the exact pesticide in the bait was not available for several months. This information was therefore only of help in confirming suspicions retrospectively.

Badgers can be the victims of intentional or unintentional poisoning with a range of products. Pesticides are commonly incriminated but more unusual products, such as paracetamol, have been identified in poisoned baits recovered from badger setts (Table 3). DEFRA’s Wildlife Incident Investigation Scheme has investigated a number of incidents in which badgers have been poisoned. Of 54 incidents investigated between 1998 and 2001, 10 were confirmed to involve pesticides (Table 2). Slug bait poisoning was confirmed in three of these cases: 1 methiocarb, 2 metaldehyde. Rodenticide poisoning was also recorded, involving anticoagulant compounds such as difenacoum and bromadiolone.

Poisoning incidents can arise either as the result of misuse or deliberate abuse of the pesticide. Misuse of a pesticide arises as a result of careless, accidental or wilful failure to adhere to the correct practice. Abuse of a pesticide is defined as the deliberate and illegal attempt to poison animals. All aspects of pesticide advertisement, sale, supply, storage and use are fully regulated under the Food and Environmental Protection Act 1985 (FEPA) and the Control of Pesticides Regulations 1986 (COPR).

Badgers like peanuts and treacle and this combination appears to be commonly used as a vehicle for poisons in cases where badgers are deliberately targeted. The presence of blue peanuts is therefore strongly suggestive of a deliberate attempt to poison badgers. Metaldehyde is readily available and was the single most often abused

compound (Barnett et al 2001). Of 11 suspect bait samples targeted at badgers investigated under the Wildlife Incident Investigation Scheme between 1998-2001 five samples were confirmed to contain metaldehyde (Table 3).

Symptoms of metaldehyde poisoning include abdominal pain, vomiting, hyperthermia, convulsions, ataxia and other neurological signs (Hayes et al 1990). Only the latter two were seen in this case. The mechanisms of metaldehyde toxicity have been reviewed by Booze (1985). The Veterinary Poisons Information Service (VPIS) quote a median lethal dose (LD50) for metaldehyde of as low as 60mg/kg in dogs. Hayes et al (1990) quote LD50's for metaldehyde of 207mg/kg for the cat, 100-1000mg/kg for the dog and 290-1250mg/kg for the rabbit. A 15kg badger would therefore need to consume at least 900mg of metaldehyde. Based on the results of bait analysis this would be equivalent to 225g of bait. By comparison the VPIS have records of a 30kg Great Dane dying after eating 400g of slug bait and a 35kg retriever dying after eating 500g of bait.

Conclusions:

Metaldehyde poisoning of badgers is a recognised problem and should be suspected in badgers with neurological signs. Peanuts and treacle are commonly used as vehicles for poisons intended for badgers. The presence of blue peanuts in a badger's faeces is therefore suggestive of poisoning.

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