Glow jewelry (dibutyl phthalate) ingestion in cats

by

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Dibutyl phthalate, also known as n-butyl phthalate, is a nearly colorless oily liquid found in many manufactured products. In addition to being used as a plasticizer and insect repellent, it is the primary luminescent component in various glow-in-the-dark products.[1] Veterinarians at the ASPCA Animal Poison Control Center (APCC) have consulted on more than 135 cases involving cats biting into glow-in-the-dark jewelry containing dibutyl phthalate. This jewelry is commonly sold at fairs, carnivals, novelty stores, and skating arenas.

With an oral LD_{50} exceeding 8 g/kg in rats, dibutyl phthalate is considered to have a low-order acute toxicity. Different species of laboratory animals have tolerated large doses of oral dibutyl phthalate in several studies.[2] For example, rats, mice, hamsters, and guinea pigs have been given 2 g/kg/day orally for 10 days in reproductive studies. In another study, mice were fed 1% dibutyl phthalate in their diet for 105 days. It is thought that dibutyl phthalate in large doses may interfere with mitochondrial respiration.[2] Respiratory paralysis has been reported as the cause of death in animals receiving lethal doses of dibutyl phthalate.[1]

One glow-in-the-dark necklace carried by a national chain of novelty stores contains 3 ml of liquid consisting primarily of dibutyl phthalate. An 8.8-lb (4 kg) cat that ingests the entire contents of one necklace would consume less than one-tenth the rat oral LD_{50}. In calls received by the APCC, cat owners usually reported that most of the liquid remained in the necklace.

Almost all cats that bite into glow-in-the-dark jewelry exhibit a sudden onset of profuse salivation. Nearly 50% of cats exhibit various neurologic signs, primarily hyperactivity and aggressive behavior. Although the signs seem severe to the owner, complete recovery, with or without treatment, generally occurs within minutes. No long-term effects or deaths have been reported to the APCC (ASPCA APCC: Unpublished data, 1999). The extremely unpleasant taste of dibutyl phthalate probably limits the exposure in most of these cases to minute quantities of the chemical, and most, if not all, of the signs are likely behavioral responses to the unpleasant taste.

Treating cats that have ingested small amounts of dibutyl phthalate includes immediately feeding small quantities of milk, canned cat food, tuna juice, or other highly palatable food to dilute the chemical in the mouth and provide a more agreeable taste. Wash drops of the chemical off the skin or coat with soap and water to prevent a recurrence of signs after grooming. In the event of ocular exposure, flush the cat's eyes with copious amounts of water. There is no known antidote for dibutyl phthalate poisoning, so closely monitor animals that have ingested unusually large amounts of the chemical, and provide appropriate decontamination and supportive treatment as necessary. Most exposures to glow-in-the-dark jewelry by cats involve an insignificant ingestion of dibutyl phthalate, resulting in transient signs that require minimal treatment.

References

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2. Hathaway, G.J. *et al*.: *Proctor and Hughes' Chemical Hazards of the Workplace*, 4th Ed. (G.J. Hathaway *et al*., eds.). Van Nostrand Reinhold, New York, N.Y., 1996; pp 196-197.

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