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SUSPECTED INTOXICATIONS BY VETERINARY APPROVED INSECTICIDES IN SMALL ANIMALS

Introduction

The Dutch Poisons Information Center (DPIC) can be contacted 24/7 for queries about acute intoxications, both in humans and animals. In 2015, the DPIC received almost 5.400 veterinary information requests. Annually, around seventeen percent of all veterinary consultations are related to (suspected) intoxications by pesticides and disinfectants. In almost half of these cases animals are exposed to insecticides [(1)]. Generally, veterinarians consult the DPIC when an insecticide is overdosed or applied to the wrong species, applied via an alternative exposure route, and when symptoms are present after therapeutic use of a product. The DPIC conducts follow up studies for example in case of reports of unexpected toxicity with therapeutic use, increases in information requests with certain products, including new products, or a change in the number and/or nature of reported symptoms with certain products. In this lecture an overview is given of the most frequently encountered insecticides and related follow up studies performed by the DPIC.

Methods

All information requests made to the DPIC are registered in a database. This database was analysed retrospectively from January 1st 2014 until December 31th 2016, concerning suspected intoxications with insecticides in animals. Keywords used were: veterinary approved brand names and active ingredients (classified as insecticides in the database). This allowed for identification of professional agricultural and common household products. The animal species and exposure circumstances were recorded.

Results

A total of 779 consultations were recognized concerning 1157 exposures. Several animals were exposed to product containing a combination of active substances. The majority of species concerned were cats (55.5%) and dogs (31.3%) and 25 different active ingredients were identified. The most common active ingredients reported were permethrin, imidacloprid, diazinon, fipronil and indoxacarb. Many cats were exposed to dog spot-on formulations containing both permethrin and imidacloprid. Cats are extremely sensitive to permethrin and are often presented at the veterinary practice with permethrin related tremors and convulsions. Dogs were more often exposed to imidacloprid alone, after access to common household products such as ant bait. No toxicity is expected in these cases as imidacloprid concentrations are low. However, as dogs usually eat the entire product including the package, foreign body related problems could be expected. Follow up studies are performed in relation to indoxacarb, diazinon and the new isoxazoline insecticides fluralaner, afoxolaner and sarolaner. In relation to indoxacarb, available on the market since 2012, all cases (n=55 in 5 years) involving cats exposed to a therapeutic dose were followed-up. Several cats developed mild to severe neuromuscular signs. Convulsions were reported in eight cases. These cases contributed to an adaptation in the paragraph on adverse effects of the product leaflet (SPC). In 2014, an increase in diazinon related information requests was seen compared to previous years (11 cases in 2010 and 51 cases in 2014). Especially in cats more pronounced cholinergic effects with therapeutic use were reported to the DPIC. Cholinergic effects are a known adverse effect of diazinon, an organophosphate insecticide. Currently, diazinon related information requests are decreasing (12 cases in 2016), possibly due to the fact that in some products diazinon is replaced by dimethicon, a non-toxic silicon-based organic polymer. Isoxazoline insecticides e.g. fluralaner, sarolaner and afoxolaner are available on the market since November 2014 (afoxolaner and fluralaner) and May 2015 (sarolaner). The most frequent reported adverse effects so far are vomiting and diarrhea. Up to December 31th 2016, the DPIC received 6 human and 14 veterinary cases. Veterinarians consulted the DPIC because cats ingested a dog formulated chewable tablet, pipet fluid was ingested after licking the fur and when animals were overdosed (max. 3x therapeutic dose). Although no serious symptoms have been reported to the DPIC thus far, the follow up study concerning these new isoxazoline insecticides will be continued.

Conclusion

All information requests, human as well as animal related, made to the DPIC are registered in one database. Continuous analysis of the database allows the possibility for trend analysis, early warning and post marketing surveillance. Good contact with authorities like the Medicines Evaluation Board (CBG-MEB) contribute to an increase in product safety. Feedback from veterinarians is invaluable for this process.

References

1. Mulder-Spijkerboer HN, Kan AA, Van Velzen AG, Van Riel AJHP, De Vries I. Acute intoxications in humans and animals. Annual report 2015, Dutch Poisons Information Center. https://www.umcutrecht.nl/nl/Subsites/Nationaal-Vergiftigingen-Informatie-Centrum-(NVIC)/Nationaal-Vergiftigingen-Informatie-Centrum-(NVIC) (accessed feb, 14, 2016).