PYRETHROID TOXICITY IN TWO LITTERMATE PUPS AND ITS MANAGEMENT

Smita
Veterinary Assistant Surgeon, Department of Animal Husbandry, Kabirdham (Chattisgarh)

Introduction

Pyrethroids are synthetic cohorts of their natural counterpart substances (pyrethrins) which vary both in structure and potency. These compounds are generally more toxic to insects as compared to mammals and persist longer in environment than pyrethrins (Hansen, 1994). A number of spot-on pyrethroid formulations have been registered for topical use in household pets for flea and tick control while some products are marketed for household use, and still others used for agriculture (Talcott, 2009). Though they have a wide margin of safety when used with caution on dogs but inappropriate or accidental application of these products could prove to be fatal. The present communication puts into record a case of pyrethroid toxicity in a pair of puppies and its successful treatment.

History and Clinical findings

A pair of male Labrador retriever puppies aged 2 months, weighing around 3 kg each belonging to same owner were presented with the history of hypersalivation, muscle tremors, ataxia and intermittent vomiting for last 3 hours. Anamnesis revealed ingestion of All Out® mosquito coil containing d-Transallethrin 1% w/w) at owner's residence in the early hours of morning. Careful clinicophysiological examination of both puppies was carried out which revealed information as under:

Table no. 1: Clinicophysiological parameters in intoxicated puppies

Animal	Rectal temperature (^{0}F)	Heart rate (Beats/min.)	Respiration rate (Breaths/ min.)	Colour of visible mucous membrane	Skin tent Test
Puppy 1	103.6	220	37	Red (Congested)	4 seconds
Puppy 2	103.2	200	35	Red (Congested)	>4 seconds

During the due course of time, both puppies started showing signs of hyperexcitation and finally became convulsant. Based on the history and clinical findings, the puppies were tentatively diagnosed to suffer from pyrethroid toxicity and accordingly a routine line of treatment for poisoning was planned.

Treatment

Medicinal therapy was initiated with low dose of atropine sulphate @ 0.04mg/kg to control the parasympathomimetic signs (salivation), anticonvulsant agent diazepam @ 1mg/kg IV to control seizures and antihistaminic agent chlorpheniramine maleate were given admixed with sufficiently large amount of intravenous fluid Normal Saline @ 75 ml/kg/hr were administered rapidly. After 20 minutes of this treatment, both puppies started showing some signs of improvement but retching movements were still present. Hence, antiemetic agent ondansetron @ 4mg/ kg and Vitamin B complex preparation 1 ml as a supportive therapy were also administered to both patients.

Strict dietary rest was advised for 3 days and both patients were administered 250 ml DNS and vitamin B preparation I/V daily along with oral administration of hepatoprotective agent (Silymarin) and digestive enzyme preparation (Bestozyme) @ 5 ml twice daily. Feeding of milk and soft diet from 4th day onwards was started and then gradually changing the diet to normal food was achieved within a week.

Results and Discussion

In present clinical situation, both puppies started showing positive response to therapy with signs of improvement within half an hour of initiation of therapy followed by absence of salivation or seizures post-treatment. The animal urinated profusely

during the course of fluid administration thereby giving indication of the normal functioning of renal system which gave an indication of good prognosis.

Animals that have ingested toxicants are seen regularly in clinical practice. Because of lack of information in literature about the various compounds accidently ingested in veterinary patients, a general line of treatment aimed at alleviation of the clinical symptoms and early elimination of toxic substance from the body is generally preferred in clinical practice (Brown-Harcourt *et al.,* 2000). Pyrethroids have been found to show potential insecticidal properties with least toxicity in mammals which is attributable to a combination of their faster metabolic disposal as they are fat soluble compounds that undergo rapid metabolism and excretion after oral or dermal absorption (Hansen, 1994).

The clinical signs most commonly seen with pyrethroid toxicosis are generally related to the central nervous system like hyperesthesia, generalized tremors, muscle fasiculations, hyperthermia, and seizures (Volmer *et al.,* 1998). There is no specific antidote for pyrethroid toxicity but atropine sulphate can be used at low dose to control hypersalivation along with diazepam to control muscle tremors and seizures (LeClercq *et al.,* 1986). Fluids may be needed in sufficient amount (60-90ml/kg/hr) to correct the hydration level and hasten the elimination of toxic compound and its metabolites from the body is necessary to maintain vital functions of the patient. There is no evidence in the available literature till date which implicates pyrethroids causing toxicity in puppies. This case demonstrates the first of its kind and gives an example of successful management. It also highlights the importance of rapid access to properties of a poison which appears to be unfamiliar in veterinary clinical practice.

References

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