SUCCESSFUL CLINICAL MANAGEMENT OF COMBINED TOXICITY OF CYPERMETHRIN AND FIPRONIL IN WHITE PEAFOWLS - A CASE REPORT

Jacob Alexander[1], M.G. Amritha Priya[2], Silpa Sasi[2] and Syam Chandran[3]

[1]Senior Veterinary Surgeon, [2]Internship trainee, Zoological gardens, Department of Museums and Zoos, Thiruvananthapuram, Kerala, [3]Odd hour Veterinarian, Veterinary Hospital, Panthalam, Kerala.

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ABSTRACT

Cypermethrin and fipronil are widely used insecticides belonging to pyrethroid and phenyl pyrazole group, respectively. Toxicity in cats and dogs as well as humans has been reported earlier but rarely in birds. This is the first report of combined toxicity of cypermethrin and fipronil in white pea fowls (*Pavo cristatus*) and its successful clinical management.

Keywords: White pea fowl, cypermethrin, fipronil

INTRODUCTION

Cypermethrin is a synthetic pyrethroid widely used as insecticide due to its high potency, rapid metabolism, less tissue accumulation, low environmental persistence and low toxicity in mammalian species (Das and Parajuli, 2006). Cypermethrin is a fat soluble compound and undergo rapid excretion after oral or dermal exposure (Hansen *et al*., 1994). Pyrethroids alter the normal function of the insect nervous system by slowing the opening of voltage gated sodium channels. The action on the nervous system results in the clinical signs encountered in pyrethroid toxicity (Richardson, 2000).

Fipronil is a broad spectrum insecticide that specifically targets the gamma amino butyric acid receptor (GABA receptor) and glutamate gated chloride channel resulting in central nervous system toxicity (Hosie *et al.,* 1995). Fipronil has higher toxicity to insects than mammals due to its greater potency in blocking insect isoform of GABA gated chloride channels than their mammalian counterpart (Hainzl *et al.,* 1998).

CASE HISTORY AND OBSERVATIONS

Two white peacocks and a white peahen maintained in the open enclosure of Zoological garden, Thiruvananthapuram were seen infested with tick with more intensity on the head. The birds were dipped in cypermethrin (0.15%, 15mL in 10L of water) solution up to the neck and fipronil (2.5 mg/ml, 80mL) was sprayed profusely on to the head and neck after closing the eyes and nostrils with cotton. The birds did not show any unusual signs

and all the ectoparasites on the body died. However, the birds became re-infested within three days and the same procedure was repeated on the fifth day and shifted from the enclosure. The birds developed drooping, incoordination, tremors and swaying of head and neck after one hour. Absorption of chemicals might have been enhanced by the wounds inflicted by the ectoparasites.

TREATMENT AND DISCUSSION

All the three birds were treated with Midazolam (Mezolam 1mL, 5mg/ml, Neon laboratories Limited) at 0.2 mg total dose, Dexamethasone 0.5ml (Dexona-vet 5mL, 4mg/ml, Zydus Animal Health) and B-complex vitamin 1ml (Polybion 2 ml, Merk Limited) as intra-muscular injections and Health up syrup (Vetoquinol pets) 2.5 ml and egg-white 15 ml orally. The birds were also given supportive oxygen therapy.

Fig. 1. Ticks on the head of pea fowl

Fig. 2. Engorged ticks on the neck of white pea fowl

The intensity of symptoms was higher during third and fourth hours and then gradually decreased and completely ceased within 12 hours.

Dermal absorption or ingestion of cypermethrin usually causes moderate toxicity in animals. Symptoms of dermal exposure include tingling, incoordination, seizures and may even result in death (Westcott and Reichle, 1987).

The potential for fipronil to induce specific neurotoxicity in target and non-target species has been reported. Topically applied fipronil is sequestrated by sebaceous glands and is gradually released over a two month period (Dryden *et al*., 2000). Notable species differences have been found in transdermal penetration of fipronil (Birckel *et al*., 1996). The application of fipronil to damaged or inflamed skin can increase the transdermal penetration and thus can result in systemic toxicity.

SUMMARY

The absence of sebaceous glands and comparatively thin skin can result in increased transdermal absorption of fipronil and cypermethrin in birds. The neurological signs due to combined toxicity of fipronil and cypermethrin can be managed successfully with symptomatic treatment.

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