

Case Report

**ACUTE ORGANOPHOSPHORUS COMPOUND POISONING IN CATTLE:
A CASE REPORT**

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SUMMARY

A case of an acute organophosphorus compound, **GOLDFLEECE** poisoning involving 39 cattle at Abubakar Tafawa Balewa University, Bauchi is reported. The animals were overexposed to the compound following routine tick spray. Within 15 minutes after the spray of the compound, 26 animals were recumbent showing foamy salivation, muscles stiffness with paralysis, severe respiratory distress and protraction of the tongue. In some animals bloat, cough, lacrimation and blindness were observed. Fifteen (15) animals died within an hour and 11 were resuscitated following multiple injections with atropine sulphate. Thirteen (13) other animals were treated and confined. Respond to treatment was excellent except for 2 animals that exhibited the convulsion episode and collapse 24 and 48 hours respectively past treatment. They were treated with additional dose of atropine and chlorpromazine (tranquilizer) and good response was obtained.

KEYWORDS: Poisoning, organophosphorus compound, cattle

INTRODUCTION

Organophosphorus (or organophosphoric Acid Esters) compound (OPC) are commonly presented as phosphates, phosphonates, phosphothionates, phosphothiolate or phosphodithiolates. They inhibit a cholinesterase which is the enzyme that splits acetylcholine (the one of the neurotransmitters of in the autonomic nervous system) in to acetate and chlorine (Seirfert, 1996).

OPC have an affect on the nervous system of the arthropods and are used in dips, sprays, pour-ons, dusting powders etc, against all types of arthropods and it was reported that depending on the formulation used, most OPC products are easily reabsorbed after dermal, perenteral or oral application. They are metabolized quickly with a short residual effect, a lesser

tendency to develop resistance and do not persist long in the environment as compared with chlorinated hydrocarbons (Meerdink, 1989; Seifert 1996).

OPC poisoning in animals produce a syndrome indicative of stimulation of the parasympathetic nervous system and post ganglionic cholinergic nerves of the sympathetic nervous system but some compound cause delayed neurotoxicity (Radostis *et al.*, 1997). Generally, the inactivation of cholinesterase by the OPC produce the muscarinic (dyspnea, gastrointestinal hypermotility, salivation, sweating, etc) and nicotinic (tremour, spasm, convulsion etc) responses similar to that of acetylcholine overdoses (Hunter, 1994; Radostits *et al.*, 1997). Anticholinergic agents such as atropine and oximes are the specific antidotes of OPC poisoning. The agents antagonize the muscarinic effect of the acetylcholine and

thus block transmission at parasympathetic and postganglionic nerve endings. Although atropine does not reverse the nicotinic effect of OPC, it is a drug of choice in OPC poisoning treatment with a variable degree of success (Abdelsalam, 1987; Radostits *et al.*, 1997).

CASE REPORT

Thirty-nine (39) Zebu (Bunaji) cattle comprising of 28 cows, 5 heifers, 4 calves and 2 bulls, belonging to the School of Agricultural of Abubakar Tafawa Balewa University, Bauchi, were sprayed with organophosphorus acaricide (GOLDFLEECE[®]) as a routine spray against ectoparasites. The goldfleece[®] used contains *daizinin* (0,0 diethyl-2-isopropyl-4-methyl-pyrimidil-6 phosphorothionate) presented as 16.2% w/v (162mg/ml) which is to be diluted in

the ratio of 1:1000 as dip or spray.

The history revealed that goldfleece[®] was constituted as directed by the manufacturers, but all the 39 animals were heavily sprayed while in the corral with a high pressured sprayer. Within 15 minutes following the spray most of the animals were excited and started exhibiting various signs of OPC poisoning. The most prominent signs include; profuse sweating, excessive foamy salivation, respiratory distress, protrusion of the tongue, excessive lacrimation and blindness. Within the period of the episode, muscles spasm and collapse due to inco-ordination was witnessed in 26 animals. Bloat was also witnessed in 8 animals that were down. The case was diagnosed as and acute organophosphorus compound poisoning.

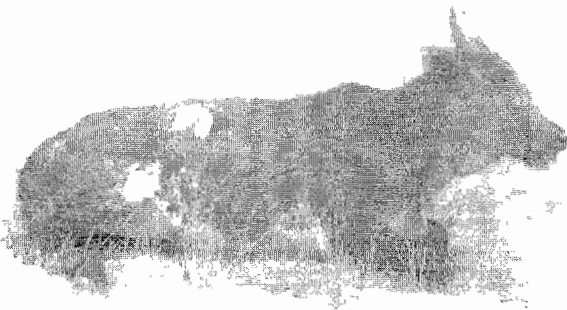


Fig. 1: Stiffness of neck, protrusion of the tongue and hindlegs paralysis



Fig. 2: Hindlimb paralysis and protrusion of the tongue

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Management

The animals were removed from the corral and moved to a crush and confined except those that were already recumbent. Treatment with atropine sulphate (specific antidote of OPC poisoning) commenced almost immediately with preference given to those with multiple signs of poisoning.

Atropine sulphate was administered at 0.25mg/kg body weight, with half of the dose given by slow intravenous (i/v) injection and the remainder by intramuscular (i/m) injection. The injections were repeated at 3 hours interval or as the signs returned and continued over a period 18 hours. Most of the cows which had received large quantity of the chemical did not respond to treatment and many of them died of severe bloat and respiratory distress.

Although the use of troaca and cannula was employed to relieve the bloat, no animal was saved following this procedure. Furthermore, the gravity of the problem did not allow the use of soap or detergent to wash the residual chemical from the skin of the animals, so also the use of adsorbents to adsorb any residue in the gastro-intestinal tract.

The response to treatment was excellent mostly after the second and third injections. However, 15 animals died within an hour of the incident, while 11 animals that were down recovered completely with a better response among the calves and heifers.

Thirteen (13) other "lightly" exposed animals were also treated with atropine sulphate twice at the same dose at 4 hours interval. None of these animal exhibits any sign of poisoning. Two surviving animals showed convulsion then collapse on the factor show days pest treatment. They were treated with additional does of atropine

sulphate at 0.25mg per kg body weight and chlorpromazine (tranquilizer) at 1mg/kg body weight to take care of nicotinic effects. The response was very good, and the two animals recovered fully.

DISCUSSION

OPC poisoning was reported as one of the commonest poisoning in animals following accidental exposure to a recently sprayed areas particularly orchards were the most toxic compounds are frequently used (Radostits *et al.*, 1997). Many accidents occur as a result of improper use, either because of too high concentration of the insecticide in a spray or more commonly because of the application to animals of products containing oily bases designated specifically for spraying walls (Seifert, 1996; Radostits *et al.*, 1997). In this case improper use and outright omission appeared to be the main cause of the poisoning.

In the absence of spray race or cattle handling facilities, individual animals needs to be restraint and sprayed – accordingly (Saidu, 1990). The sprayer pressure of 3kg/cm² is enough to give effective soaking and the nozzles of the sprayer should be inclined at 45° (Saidu, 1990; Seifert, 1996). It is equally important to avoid the face (eyes, nose, mouth, etc) during spray and pay attention to feet, tail and perineum of the animal which are the sites where ticks attach themselves (Seifert, 1996). In this case, it was revealed that most animals were over exposed via inhalation and absorption by per cutaneous and per conjunctival routes. Furthermore, precaution were not adhered to, the animals were just sprayed in group in the corral early in the morning when the atmosphere was somehow windy. It was further confirmed that the drug used was among the

Petroleum Trust Fund (PTF) supplies almost due to expire by September this year (2003). Thus it might have an increased toxicity due to longer storage.

In conclusion, chemical poisoning, most especially OPC must be avoided in every livestock settings. It is a highly toxic compound which can within minute wipe the entire flock. There is need to adhere strictly with manufacturers' guide and specific antidotes must be made available. Application of these chemicals without the consent of a professional may be highly suicidal. In the recent past, OPC are included in the instruments of modern biological warfare as "nerve gases" (Radostitis *et al.*, 1997). Therefore, protection of public health is additional responsibility for anybody intended to use these chemicals.

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