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Case Report

Fipronil Compound Consumption Presenting as Status Epilepticus

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ABSTRACT

Fipronil is a broadspectrum N-phenylpyrazole insecticide with gamma-aminobutyric acid type A receptor inhibitory action causing hyperexcitability of central nervous system. There is no literature reported in the past concerning its acute toxicity in human beings. A case report is useful for workers in medical and veterinary field. Hence, we are reporting a case in which young male intoxicated with fipronil compound was presented to the emergency department for having generalized tonic-clonic seizures and subsequently with the features of delirium for few days. This patient was treated with benzodiazepines which controlled the seizures and antipsychotics were given for few days for treating the psychosis.

Key words: Fipronil, GABA inhibitors, midazolam, psychosis, seizures

INTRODUCTION

Deliberate self-poisoning with insecticides is a very common issue globally and accounts for 300,000 deaths in a year.[1] A new class of insecticides is being developed in last two decades in the view of mortality due to accidental exposures of organophosphorus and organochlorine compounds. These new compounds fipronil one among them are considered less toxic to human beings. However, there is no enough data or trials conducted on human beings regarding their toxicity; hence, post-marketing surveillance are needed to identify any adverse health effects associated with these products. Hence, we are reporting a case of acute fipronil poisoning presented with status epilepticus and managed with benzodiazepines and antipsychotics for treating the acute psychosis for 3 days.

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CASE REPORT

A 25-year-old male was brought to the emergency department with an alleged history of fipronil compound consumption following which he developed three episodes of generalized tonic-clonic seizures and altered sensorium. There was no other significant history and no past history of head trauma, stroke or seizure disorder. Patient on examination had a normal pulse, blood pressure, and O_2 saturation. Pupils were bilaterally pinpoint. Central nervous examination revealed that apart from altered sensorium patient had coarse tremors, incoordination. Per-abdomen examination revealed the retention of urine. Computer tomography of the brain was normal [Figure 1], routine blood investigations such as hemogram, renal function tests, liver function tests, and electrolytes were also normal. The patient was given with 4 mg of lorazepam on arrival to the hospital. The patient had two more episodes of seizures

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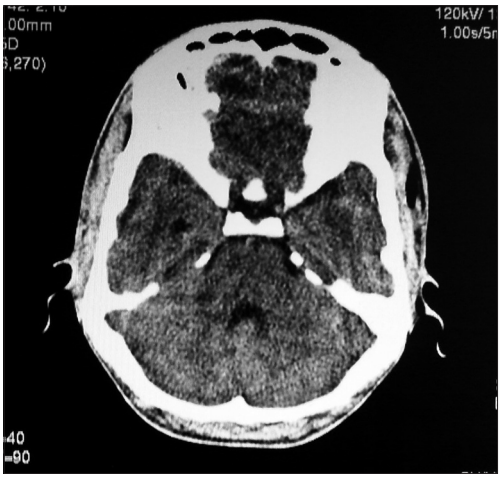


Figure 1: Normal computer tomography of the brain

even after two repeated doses of lorazepam. Injection midazolam 1 cc given as stat dose and repeated every 4 h following which seizures did not occur. The patient regained consciousness after 10 h and was responding to oral commands. However, the patient remained delirious for 3 successive days. On additional antipyschotics along with benzodiazepines patient gradually improved within a week and got discharged on 8th day.

DISCUSSION

Fipronil (CAS 120068-37-3, MW 437.16) is a relatively new insecticide with a trifluoromethylsulfonyl moiety. Fipronil is used in granular turf products, seed treatments, topical pet care products, gel baits, liquid termiticides, and in agriculture. It is used for control of locusts, grasshoppers, fleas, ticks, cockroaches, ants, termites, weevils, and other insects on crops.[2] It was first registered by the US environmental protection agency, in 1996.[3] Fipronil produces greater toxicity in insects as compared to mammals as its action is limited to gamma-aminobutyric acid (GABA) receptors of insects.[3] Furthermore, it causes blockade of neuronal glutamate-gated chloride channels, which are found only in invertebrates.[4] However, even though the main compound found to be relatively safer in mammals but their metabolites have pronounced effect on mammalian receptors. Fipronil-sulfone, the primary biological metabolite of fipronil is reported to be twenty times more active at mammalian chloride channels than at insect chloride channels.[5] Fipronil-desulfinyl, the primary environmental metabolite (photoproduct) of fipronil is 9–10 times more active at the mammalian chloride channel than the parent compound, reducing the selectivity between insects and humans when exposed to this metabolite.[6] Technical grade fipronil is considered moderately toxic by ingestion with an oral LD50 of 97 mg/kg in rats and an LD50 of 95 mg/kg in mice.[7] Acute fipronil toxicity in laboratory rodents is characterized by tremors, altered activity or gait, hunched posture, agitation, seizures, and mortality at doses >50 mg/kg.[2]

Clinical signs and symptoms reported after ingestion of fipronil by humans include sweating, nausea, vomiting, headache, abdominal pain, dizziness, agitation, weakness, and tonic-clonic seizures. Clinical signs of exposure to fipronil are generally reversible and resolve spontaneously.[8] Our case had presented with status epilepticus and had features of acute delirium for 3 days which responded to benzodiazepines and antipsychotics.

CONCLUSION

Fipronil belonging to the group of newer insecticides is a GABA inhibitor for which acute poisoning in the form of consumption has considered nonlife-threatening; however, the potential effect of this agent mandates the use of benzodiazepines as a first line drug to control the seizures. These compounds can said to be relatively safer than conventionally used lethal organophosphorus and other pesticides.

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Conflicts of interest

There are no conflicts of interest.

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