

Case Report: Pyrethroid Poisoning

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Abstract

Chinese chalk named “Laxmanrekhaa” is used as an insecticide which contains Cypermethrin and Deltamethrin, they are Pyrethroid compounds with high insecticidal potential. It is considered less toxic for human use, because of poor dermal absorption, rapid metabolism, less tissue accumulation and environmental persistence. Cases of accidental pyrethroid poisoning have been reported, but poisoning with suicidal intention is extremely rare.

We report a case of 62 year old man presented with abnormal behavior and loss of consciousness for nearly 15-20 minutes after contact with Laxmanrekhaa chalk. There was no history of convulsion, diarrhea, frequent urination, chest pain, or fever.

Keywords: Pyrethroid, Poisoning, Laxmanrekhaa

Introduction

Lethal and potent poisonous insecticides killing cockroach and other insects in the kitchen are easily available over the counter to the public worldwide. Pyrethrin and pyrethroids are commonly used insecticides. Pyrethrins are natural botanical

insecticides derived from extracts of the flowers of Chrysanthemum genus, primarily Chrysanthemum cinerariaefolium and coccineum, while pyrethroids are synthetic derivatives of pyrethrin.^[1] They are natural environmental products with low toxicity to mammals degrading in daylight rapidly due to photo labile properties. They have been synthesized to be similar to pyrethrins, but are more resistant in the environment. Pyrethroids are simply divided into two types. Type I has a cyclopropane carboxylic acid structure, whereas type II has an alpha cyano group with benzylic carbon.^[2] Type II pyrethroids have more toxic abilities such as salivation, hyper excitability, and seizures. Local effects such as skin contamination producing paresthesia and gastrointestinal irritation are also seen. Pyrethroids may lead to poisoning in human beings through accidental, occupational exposure, or intentional events.^[3,4]

Cypermethrin and Deltamethrin are synthetic pyrethroid pesticide (type II) widely used in crops against pest and insect. The insecticidal actions of pyrethroids depend on their ability to bind to and

disrupt voltage-gated sodium channels as they are important targets for neurotoxic effects of pyrethroids in mammals. ^[6,7] At higher concentration of Pyrethroid there is delay of closure of voltage-sensitive sodium channel, which is the main mechanism and also act on GABA-gated chloride channel which may be responsible for seizure. ^[8]

Type I can manifest as hypersensitivity reaction, like anaphylaxis, reflex hyper excitability and fine tremors. Type II produces watery diarrhea, coarse tremor, reflex hyper excitability, choreoathetosis, and seizure. On ingestion it produces throat and epigastric pain, nausea, vomiting, salivation, dysphagia, dizziness, headache, and fatigue. Burning or tingling sensation, numbness, paresthesia's, lacrimation, photophobia, conjunctival congestion, and bronchospasm are the other manifestations due to direct or dermal exposure. Consumption of high doses may lead to neurotoxicity like, tremors, fasciculation, convulsion, coma, pulmonary edema, respiratory failure and cardiac conduction disturbances. Management of pyrethroid poisoning is mainly supportive and symptomatic as there is no specific antidote. Gastric lavage and activated charcoal can be given if patient presents within one hour of ingestion. Atropine may be given to decrease secretions in cases of increased salivation and pulmonary edema. ^[8,9]

Case Report

A 62 year old male patient visited the Endocrinology department for his glycemic control. He had Type 2 Diabetes Mellitus for the past 20 years. He is a known case of Hypertension, CABG done in 2012 and hernia repair done in 2017. He was taking the following medications: Metformin 1gm 0-0-1, T.Rosuvastatin 10 mg 0-0-1, T.Clopidab 75 mg 0-0-1, T.Nebivolol 2.5 mg 1-0-1, Inj.Lupisullin M 30/70 20-0-0 units. He had

elevated fasting blood sugar level in about 150 mg/dl and HbA1c of 7.5 %. His lab reports showed he had protein leakage via kidney as his urine micro albumin level was elevated (52.49 mg/g creat). He had an episode of loss of consciousness and abnormal behavior lasting for 15-20 minutes 2 days before visiting the hospital which the family member thought as a hypoglycemic episode. His wife managed the situation by giving a teaspoon of honey. Then he was taken to a nearest hospital. After this abnormal behavior his sugars were 135 mg/dl. Before the onset of this abnormal episode he used Laxmanrekhaa Chinese chalk for killing ants and cockroaches in the house. He had drawn on the walls and sides of windows using the chalk without wearing a mask or covering the nose. He was managed symptomatically at the nearest hospital.

Conclusion

Pyrethroid poisoning is common in clinical practice. Given its low toxicity for humans, most patients do not manifest significant symptoms. However, in mega-dose intoxication or those with mixed poisoning, particularly in combination with organophosphorus compounds, patients may present with life-threatening manifestations that require intensive care management. Treatment is supportive and symptomatic. Overall prognosis of Cypermethrin/Deltamethrin poisoning is excellent despite ingestion of heavy doses and life-threatening presentation.

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