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RESEARCH ARTICLE

"TRESPASSING THE FORBIDDEN LINE "LAKSHMANREKHA" - A RARE CASE OF LAKSHMANREKHA POISONING PRESENTING TO ED

***Dr. Jeevana Kurugodu, Dr. Dolly C. Yadav and Dr. Indranil Das**

Institute of Emergency Medicine, Medeor Hospital, IMT Manesar, Gurgaon Haryana, India

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ABSTRACT

"Lakshmanrekha" also known as an insecticide is a combination of Cypermethrin and Deltamethrin. Both are pyrethroid compound and is widely used due to its high insecticidal potential and slow resistance in pest. 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 at work places have been reported, but poisoning with suicidal intention is extremely rare. We report a case of 33-year old female who presented to our emergency department with complaints of recurrent vomiting, epigastric and throat pain, increased salivation, drooling, lacrimation, anxiety after ingestion of Lakshmanrekha. There was no history of convulsion, diarrhea, frequent urination, chest pain, or fever.

**Corresponding author: Dr. Jeevana Kurugodu*

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INTRODUCTION

Increased over-the-counter availability of these insecticides is likely to increase the prevalence of their toxicity. Furthermore, resemblance of cypermethrin toxicity to organophosphate poisoning pose a diagnostic dilemma in the emergency department (Ray and Fry, 2006). It is also used for crack, crevice and spot treatment for control of insect pests in stores, warehouses, industrial buildings, houses, apartment buildings, greenhouses, laboratories and on ships, railcars, buses, trucks and aircraft. It may also be used in non-food areas in schools, nursing homes, hospitals, restaurants, hotels, and in food processing plants and as a barrier treatment insect repellent for horses. Cypermethrin is available in emulsifiable concentrate, ULV, and wettable powder formulations. Technically cypermethrin is a mixture of eight different isomers, each of which may have its own chemical and biological properties (Bradberry *et al.,* 2005). Cypermethrin is a moderately toxic material by dermal absorption or ingestion (Das and Parajuli, 2006). It may cause irritation to the skin and eyes. Symptoms of dermal exposure include numbness, tingling, itching, burning sensation, loss of bladder control, incoordination, seizures and possible death (Ray and Fry, 2006). Pyrethroids may adversely effect the central nervous system. Human volunteers given dermal doses of 130 ug/cm2 on the earlobe experienced local tingling and burning sensations (Lessenger, 1992). One man died after eating a meal cooked in a 10% cypermethrin concentrate that was mistakenly used for cooking oil. Shortly after the meal, the victim experienced nausea, prolonged vomiting, stomach pains, and diarrhea which progressed to convulsions, unconsciousness and coma. Other family members exhibited milder symptoms and survived after hospital treatment (Lessenger, 1992). Rats fed high doses of 37.5 mg/kg of the cis-isomer of cypermethrin for 5 weeks exhibited severe motor incoordination, while 20-30% of rats fed 85 mg/kg died 4 to 17 days after treatment began. Cypermethrin is not a skin or eye irritant, but it may cause allergic skin reactions. The amount of a chemical that is lethal to one-half (50%) of experimental animals fed the material is referred to as its acute oral lethal dose fifty, or LD50. The oral LD50 for cypermethrin in rats is 250 mg/kg (in corn oil) or 4,123 mg/kg (in water). EPA reports an oral LD50 of 187 to 326 mg/kg in male rats and 150 to 500 mg/kg in female rats. The oral LD50 also varies from 367 to 2,000 mg/kg in female rats, and from 82 to 779 mg/kg in mice, depending on the ratio of cis/trans-isomers present. This wide variation in toxicity may reflect different mixtures of isomers in the materials tested. The oral LD50 reported in rabbits is 3,000 mg/kg. The dermal LD50 in rats is 1,600 mg/kg (3), and in rabbits is > 2,000 mg/kg or> 4,800 mg/kg[2]. Deltamethrin products are among the most popular and widely used insecticides in the world [citation needed] and have become very popular with pest control operators and individuals in the United States. This material is a member of one of the pesticides called synthetic pyrethroids. This pesticide is highly toxic to aquatic life, particularly fish, and therefore must be used with extreme

caution around water. Although generally considered safe to use around humans, it is still neurotoxic to humans. Deltamethrin is able to pass from a woman's skin through her blood and into her breast milk. It is an allergen and causes asthma in some people. There are many uses for deltamethrin, ranging from agricultural uses to home pest control. Deltamethrin has been instrumental in preventing the spread of diseases carried by tick-infested prairie dogs, rodents and other burrowing animals. It is helpful in eliminating and preventing a wide variety of household pests, especially spiders, fleas, ticks, carpenter ants, carpenter bees, cockroaches and bed bugs. Deltamethrin is also one of the primary ingredients in ant chalk.

CASE HISTORY

We report a case of 33-year old female who presented to our emergency department with complaints of recurrent vomiting, epigastric and throat pain, increased salivation, lacrimation, anxiety, cough, and dyspnea. There was no history of convulsion, diarrhea, frequent urination, chest pain, or fever. She gave a history of accidental ingestion of about half piece(approx. 4cm) of anant-chalk which was unintentionally dropped in the milk glass and she drank the glass of milk 1 hour prior to arrival. There was no history suggestive of co-ingestion of any other toxin or drug. There were no relevant past medical or mental illness, or suicidal attempt. On clinical examination, patient was conscious, oriented, but anxious and restless. She did not haveconjuctival congestion with normal pupillary size. The lips and buccal mucosa were not swollen.

In the ED the patient was immediately taken to the monitored bed and hooked to the monitor.

Vitals

Pulse – 111/m and regular and no ectopy
BP- 160/90 mmhg
RR- 20/m
Spo2-98% in ra
Temp.-Afebrile
RBS- 137mg/dl

Primary Survey

Airway- Patent and maintainable
Breathing- Spontaneously, Spo2-100% with 4 L/m O2 by Nasal Canula.
Circulation- Warm, BP-70/40 mmhg and CRT-wnl
Disability- Obeying Commands and Moving 4 limbs.No FND, GCS15/15
Env/Exp- WNL, NO Rashes.

S-vomiting, epigastric and throat pain, increased salivation, lacrimation
A – No allergy
M- Antihypertensive.
P- Hypertension.
L- 1 hr ago.
E-Felt palpitation and no chest pain.

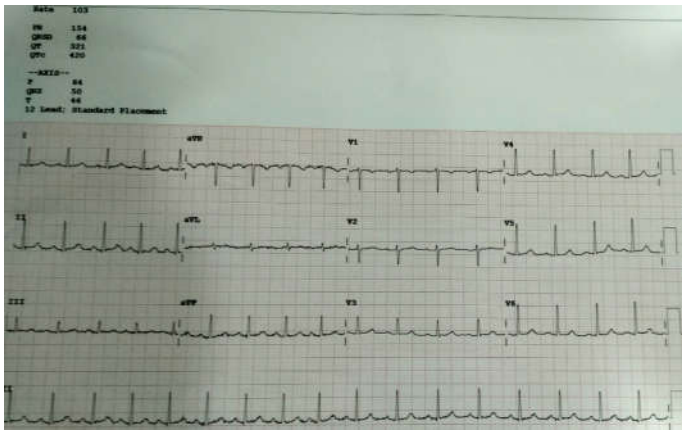
Secondary Survey

HEENT- wnl and no JVD and no Carotid bruit
Chest- B/L vbs and no creps.
CVS- s1 s2 and no added sound
CNS- Conscious and oriented and no FND
P/A- soft and no organomegaly and no Guarding and no rigidity
Extr- WNL and no rash and no injury.

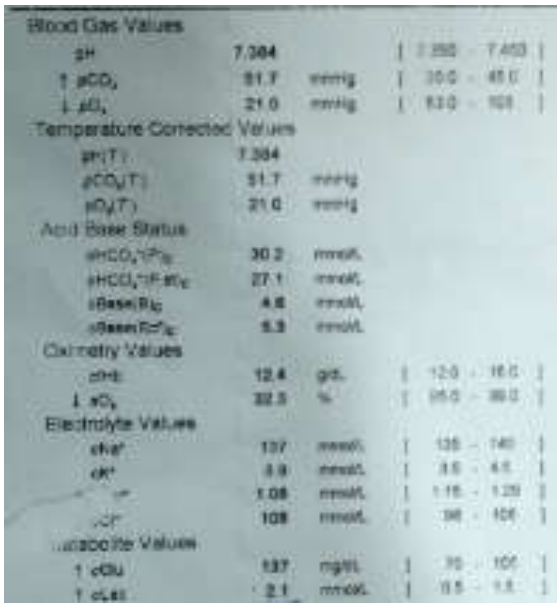
Management in ED

Airway- Maintainable and the pt. put in a Supine position
Breathing- O2 by nasal canula @ 4l/m
Circulation- Two large bore IV access taken and iv fluid started with Normal Saline Bolus.
INJ. PANTOPRAZOLE 40MG IV STAT
INJ. ONDENSETRON 8 MG IV STAT
INJ. HYDROCORTISONE 100MG IV STAT
INJ. AVIL (Pheniramine maleate) 25mg iv STAT
INJ. MONOCEF 1GM IV STAT
GASTRIC LAVAGE DONE IN ED WITH 1000ML IV NORMAL SALINE

A 12 lead ECG taken as under



BLOOD GAS ANALYSIS DONE IN ED (VBG):-



CBC- Hb-11.9, TLC-11.45, DLC Neutrophils - 83
KFT- Blood Urea – 21.7, S.Creat-0.60, S.Sodium-139.9, S.Potassium-4.44
LFT- Total Bilrubin-0.26, SGOT-25.1,SGPT-44.5, Alk. Phosphate-141.7
CXR- WNL

DISCUSSION

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 1 hour of ingestion. Atropine may be given to decrease secretions in cases of increased salivation and pulmonary oedema. Pyrethroid poisoning can be easily misdiagnosed as organophosphate poisoning. Smell of pyrethroids is somewhat related to OP because of common hydrocarbon solvents and features like fasciculation, pulmonary edema, and convulsions can occur in both the conditions. Few cases of death have been reported due to atropine toxicity given to these patients. However, normal pupillary size and plasma cholinesterase level, less requirement of atropine and excellent prognosis differentiate it from other insecticides. Case reports and case series in the past depict that pyrethroids are not completely safe, but worldwide less than 10 deaths have been reported. To conclude, cypermethrin/deltamethrin intoxication should be considered as a differential diagnosis in patients presenting to ED with classical features of organophosphorous poisoning. Emergency physician are required to be aware of this entity to avoid inadvertent administration of atropine. Overall prognosis of cypermethrin/Deltamethrin poisoning is excellent despite ingestion of heavy doses and life-threatening presentation.

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