

SEVERE ACUTE POISONING BY INTENTIONAL SELF-HARM WITH CYPERMETHRIN

Kamarul Aryffin Baharuddin ¹, Mohd Hashairi Fauzi ¹, Mohd Boniami Yazid ¹, Mohammad Zikri Ahmad¹, Wan Hazuraini Wan Zain ²

¹ Department of Emergency Medicine, School of Medical Sciences, USM Health Campus, 16150 Kubang Kerian, Kelantan

² Klinik Perdana Kok Lanas, Taman Arif, 16450 Kota Bharu, Kelantan.

Correspondence:

Kamarul Aryffin Baharuddin
Department of Emergency Medicine,
School of Medical Sciences,
Universiti Sains Malaysia,
Health Campus, Kubang Kerian
16150 Kelantan, Malaysia.
Email: amararyff@usm.my

ABSTRACT

Severe acute poisoning of cypermethrin is rare. We reported this case about a 47-year old man who was brought to the Emergency Department with drowsiness and drooling of saliva after intentional self-harm with 2.25 gram of cypermethrin. His initial condition was stable. However, nine hours after admission, he developed seizures and reduced conscious level. He was ventilated overnight for airway protection. Management of acute severe poisoning is discussed in this case report.

Key words: cypermethrin, severe acute poisoning, seizures

BACKGROUND

Pesticides are used to kill pests but they can be harmful to human being either through accidental, occupational exposure or intentional. Pesticides

poisoning is a worldwide phenomenon [1]. It accounts for a large numbers of fatalities [2]. In fact it was the commonest substance reported in cases of intentional self-harm in Malaysia [2]. Among the insecticides that are

available, the least toxic is pyrethroid [1]. It is considered less toxic for human use because of poor dermal absorption, rapid metabolism and less tissue accumulation [3]. Severe acute poisoning of this substance, even with suicidal intention is rare [4]. We report a case of intentional self-harm with cypermethrin (pyrethroid) poisoning that presented with seizure and discuss about the risk factors and the management of acute intoxication.

CASE REPORT

A 47-year-old farmer who stayed in a rural area had a quarrel with his wife before he was found in a semiconscious state after he ingested 50 ml of 'cypersect' (with a concentration of 5.5% cypermethrin which was equivalent to 2.25 g of the poison). He was first attended by a general practitioner and was diagnosed with acute poisoning. There was history of epigastric pain and blurring of vision; thus, he was immediately brought to the Emergency Department (ED) of Hospital Universiti Sains Malaysia. On examination, the patient was drowsy but hemodynamically stable. Both pupils were normal in size and reactive to light. There was frothy, drooling salivation. Initial treatment was started with 60 gram of activated charcoal (estimated patient's weight was 60kg), given through the Ryle's tube followed by intravenous (iv) ranitidine 50mg and iv hysocine butyl bromide of 20mg. His laboratory findings such as full blood count, serum electrolyte, renal profile and blood gas were normal. However random blood sugar was 8.0 mmol/l. His chest radiograph and electrocardiogram were normal.

Nine hours post admission in the medical ward, his conscious level suddenly deteriorated with Glasgow Coma Scale was 7/15 with (E1, M5, V1). Jerky movement of the upper limbs and lower limbs were noted. There were up rolling of eyeballs with drooling of saliva. Titrated intravenous diazepam 10 mg was given immediately and the seizure was aborted. He remained comatose and was referred to the anesthetic team for airway protection. He was then transferred to the intensive care unit (ICU) and was ventilated with low setting ventilator. No abnormal movement was noted during the monitoring in ICU. He was extubated the next day and later transferred to the medical ward. His recovery was uneventful and was discharged on day five since admission. Psychiatric consultation and evaluation were carried out prior to discharge.



Figure 1 Container of cypermethrin 5.5% ingested by the patient.

DISCUSSION

Cypermethrin is a type II pyrethroid insecticides, first synthesized in 1974 and later marketed in 1977 [5]. Pyrethroids are synthetic analogues of natural compounds derived from the chrysanthemum flower and are among the most effective and safe natural insecticides known because of their selective activity on insects and low toxicity for mammals and birds [6]. Pyrethroids are considered as contact poisons; affecting the insect nervous

system by opening the sodium channels and polarizing the neuronal membranes. It has rapid biotransformation and excretion by the mammalian catabolic system and their non-persistence in the environment [7].

In this case report, the patient is a male patient although in a previous study, female are more prone to self-poisoning rather than male [8]. Marital problem is also a known significant risk factor associated with adult admissions due to poisoning [9]. Other risk factors are psychiatric illness, history of previous poisoning, Chinese and Indian ethnicity in Northern Malaysia [9]. A study done in East Coast of Malaysia found that 77.8% of the cases were unintentional poisoning, 12.6% intentional and 9.6% were undetermined [10].

The most common route of acute exposure of cypermethrin is through the accidental dermal exposure. However, based on the excretion studies, dermal absorption of cypermethrin was likely to be low (less than 1.5%) [11]. Oral ingestion is more likely to produce systemic toxicity with typically developed nausea, vomiting and abdominal pain within minutes [12, 13]. Other systemic features are dizziness, increases salivation, headache, seizures, chest tightness, non-cardiogenic pulmonary edema and coma [12]. Electrocardiogram (ECG) investigation is a mandatory since it may demonstrate ST-T changes, sinus tachycardia and ventricular premature beats [12]. Seizures were the stated cause of death in four out of seven fatalities among the 573 patients presented with acute pyrethroids poisoning reported in China [12].

He F. et al (1989) proposed the diagnostic criteria for occupational acute pyrethroid poisoning grading that is useful for clinical practice in ER. The grading is as follows [12]:

Grade 1: Suspicious case

Having abnormal facial sensation, miliary papules or contact dermatitis, without significant systemic symptoms or signs.

Grade 2: Mild acute poisoning:

In addition to the above skin symptoms or signs, having significant systemic symptoms i.e. dizziness, headache, nausea, anorexia and fatigue, with listlessness, vomiting or increased stomal secretion resulting in sick-leave for more than 1 day.

Grade 3: Moderate acute poisoning:

Having aggravation of the above systemic symptoms and signs, and occurrence of mild disturbance of consciousness, or muscular fasciculation in limbs

Grade 4: Severe acute poisoning:

In addition to the above systemic symptoms or signs, having convulsive attacks, coma or pulmonary edema.

Even though it is mentioned that the toxic oral dose is more than 100-1000 mg/kg body weight and lethal dose is 1-10 g [14], a study found that even 5 g of cypermethrin poisoning may

produce no or minimal symptom and abnormal clinical sign [13,15,16].

Clothes contaminated with cypermethrin should be removed and contaminated skin should be washed with soap and water. Gastric lavage should be avoided because it may increase the risk of aspiration pneumonia [12]. Isolated brief seizures may not require treatment but if it is prolonged, intravenous diazepam 5-10mg should be administered. However, a Cochrane review showed IV Lorazepam is superior and better than IV diazepam for cessation of seizures [17]. Thus, we propose that IV Lorazepam 2-4 mg should be used as the first line, if it is available. IV phenytoin should be given when the patient develops status epilepticus [18]. The usage of IV atropine (0.6mg-1.2mg in an adult) may be useful to control excessive salivation but care must be taken to avoid atropine intoxication. In a review of cypermethrin poisoning in China, one third of the patients showed improvement of salivation and pulmonary edema after being treated with IV atropine [12]. There was also a reported case showing the effectiveness of anti-cholinergic like hyoscine and chlorpheniramine maleate in the treatment of cypermethrin poisoning in Nepal [3]. The psychiatric evaluation must be part of the management of any intentional self-harm cases as it may lead to severe personal, social and economic consequences [19].

CONCLUSION

Severe presentation of acute cypermethrin poisoning is rare. However one should have better anticipation if the clinical features and the toxic dose of the

poison are known. Prompt and supportive managements are important to prevent death. Managing the risk factors is a very important step to

prevent intentional self-harm in the future. Psychiatric evaluation is also essential for a holistic management.

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