

Mosquito Coil Poisoning with Neurological Manifestation

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ABSTRACT

Background: Mosquito coil (allerthrin) is a type of pyrethroid. Few reports describe severe poisoning after ingestion of this common household product. This is the first ever report on severe form of mosquito coil poisoning in adult.

Case Report: A case of allerthrin poisoning with neurological and gastrointestinal manifestation reported. A 19 year old house wife belonging to Bengali Hindu community presented after ingesting six pieces of mosquito coil. Initial manifestations were nausea, vomiting, sore throat. During hospital stay she had three episodes of generalized seizure. Level of consciousness altered. She received supportive management as no specific antidote exists. Recovery occurred by several days.

Conclusion: Mosquito coil (allerthrin) ingestion can infrequently induce medical emergency.

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► *Implication for health policy/practice/research/medical education:* Mosquito Coil Poisoning with Neurological Manifestation

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1. Introduction:

Pyrethroid compounds are commonly used in mosquito coil (Allerthrin) or as mosquito repellent (Prallerthrin). Majority are considered as nontoxic to human due to poor dermal penetration, quick metabolism inside system and less tissue accumulation (1). However literature shows if ingested; allerthrin may cause neuro-pulmonary-gut symptoms (1-3). Since this item (mosquito coil) is a very uncommon form of suicidal agent; possible severe adverse effects are less encountered.

2. Case Report:

A 19 year-old house wife of Bengali Hindu origin admitted after self-ingestion of six full pieces of mosquito coil. Coils were purchased by her from local shop. She crushed the coils and mixed with water to make suitable for swallowing. Pack showed coils were made from combination of allerthrin (0.12% W/W), inert adjuvant, and natural citronella oil. She was brought five hours after ingestion. Initially there were complaints of sore mouth, abdominal pain and vomiting. She received gastric lavage at the emergency department. At admission all vital parameters were within normal limits. Eight hours after admission for observation she had an episode of generalized seizure lasting several minutes. She appeared confused and semiconscious but was not in coma. Glasgow coma scale was 8/15

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(E2M3V3). There was transient rise of pulse rate and blood pressure just after convulsion. She was put on available supportive care. Two further episodes of convulsion occurred. They were managed with intravenous diazepam. No feature suggestive of alternative etiology like fever, focal neurological sign or drug abuse/withdrawal was present. Available lab parameters were for blood sugar 6 mmol/l, sodium 135 mmol/l, potassium 3.9 mmol/l, chloride 99 mmol/l, SGPT 45 U/L, serum creatinine 1.0mg/dl. Total WBC count was 10000/mm³. She slowly regained normal level of consciousness after one day. At discharge she had headache. No complications observed on follow up.

3. Discussion:

Allerthrin (C₁₉H₂₆O₃) was first pyrethroid identified in 1949. It is in group I pyrethroid with prallerthin. Prallerthin used as dermal mosquito repellent in liquid form. Pyrethroids are 2250 times more toxic to insects than mammalian (2). Mosquito coil is less common item chosen for suicide attempt among adult. Unusual structure and difficulty in swallowing may be possible reason. Two cases (1.6%) reported in a prior Bangladeshi study (4). In Srilanka 11.5% (n=121) of household product poisoning in children among 1985 to 2000 were with mosquito coil but all were accidental in nature (5). In Gujarat of India 1.1% (n=4) of suicidal attempt was with mosquito coil (6). None of mentioned studies reported severe clinical manifestation after ingestion. By dermal route paresthesia is the commonest symptom for pyrethroid poisoning. Oral ingestion causes gut irritation, sore throat, vomiting. These are the commonest systemic manifestation. Neurological manifestations are the dreaded feature. Now usual complaints reported after mosquito coil ingestion is mild form of gut toxicity. There is only one case report of mosquito coil poisoning reporting convulsion and unconsciousness in two children from India (7). Case of prallerthin ingestion resulting in pulmonary edema, convulsion had been reported (1). Pulmonary involvement was absent in current case. Mortality is very low

with pyrethroid compounds. In two series mortality rate with pyrethroid poisoning was 1.2% (n=7) and 2% (n=1) where total cases were 573 and 48 respectively (8, 9). No death was recorded in Srilanka or Gujarat (5, 6). A post mortem study from Dhaka, Bangladesh reported a single death following mosquito coil ingestion (10).

Allerthrin causes hyperneuroexcitability and tremor. Pyrethroids acts on sodium channel and delaying closure induce paresthesia and in higher concentration exert effect on GABA gated chloride channel causing seizure (1). Toxic dose of allerthrin in human was not defined. Exact amount of allerthrin ingested from six pieces cannot be estimated however in the two Indian children one piece each was enough for toxicity.

Treatment for the disease generally is supportive. Among 121 Sri Lankan pediatric cases (1985-2000) no treatment was considered necessary on ground of low concentration and poor gut absorption (5). Some reported convulsion is difficult to control. Gradual recoveries for these patients over several days are the rule (7). No long term neurological complication was observed (7).

Citronella oil is licensed in USA for dermal use as insect repellent (12). But it is being withdrawn in Canada and not approved in European Union. It is a biopesticide- a volatile oil obtained from distillation of grass. It is two type including "Ceylon type" from *Cymbopogon nardus* and Java type from *Cymbopogon winterianus*. According to US Environmental Protection Agency (EPA) Java type is in category III and Ceylon type is in category IV (11). WHO categorizes it as slightly hazardous and toxicity profile is based on animal study (12). Human toxicity is less understood and literatures are scarce. Literature reports possible harm associated with ingestion of this compound. A few fatal cases after ingestion reported. Oral irritation, CNS haemorrhage, gut congestion and lung collapse occurred in fatal cases (13). Because of possible dual poisoning effect it is not sure if citronella oil had any role to play in this lady.

4. Conclusion:

Mosquito coil is in abundant use in malaria prone areas. Though poisoning is unusual physicians should be aware of the potential danger.

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