

CASE REPORT

Organophosphate poisoning in a young child: a case report

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Abstract

Unintentional ingestions are a common form of poisoning in children worldwide. Organophosphates are commonly used in households worldwide and are a common cause of childhood poisonings. This case report describes an unintentional ingestion of a child in East Africa. A thorough patient history and a high index of suspicion are needed in recognizing an organophosphate poisoning. Prompt patient stabilization and treatment improve outcomes. Neurologic sequela may occur and thus patient follow-up is recommended.

INTRODUCTION

Unintentional ingestions are common worldwide in children and adults. Most cases in children are unintentional and are due to the ingestion of a liquid. Organophosphate insecticides are readily available worldwide and cause irreversible inhibition of acetylcholinesterase in the blood and nervous system [1]. The body is unable to break down acetylcholine without acetylcholinesterase causing an accumulation which results in a cholinergic toxidrome. These symptoms are similar in children and adults and can appear 3 to 12 h after ingestion. Symptoms include bradycardia, miosis, lacrimation, salivation and bronchospasm.

Bronchoconstriction and central nervous system depression cause respiratory failure and severe poisonings may lead to myocardial ischemia. Long-term sequelae such as neuropathy and neurobehavioral deficits can occur weeks after ingestion. For this reason, follow-up is recommended.

Although data are sparse, it is known that organophosphate poisonings are a frequent cause of emergency admissions to hospital in developing countries, especially in South-East Asia [2, 3]. In addition, it was estimated in 2010 that around 200 000 deaths occur annually worldwide due to intentional ingestion of organophosphates (suicide attempt) [4]. Here, we describe a case of unintentional ingestion by a child in East Africa.

PATIENT INFORMATION

A previously healthy child under 5 years of age with no other health conditions developed weakness and lost consciousness at home after ingesting approximately 6 ml of pesticide powder diluted in water. The ingestion occurred 2–3 h prior to arrival to the hospital. The unlabeled ingested powder used as a pesticide was brought to the health facility by the family.

CLINICAL FINDINGS

The child's vital signs upon arrival were a heart rate of 130 bpm, a respiratory rate of 20b/m and random blood sugar 442 mg/dl, with an illegible pulse oximeter. He weighed 9.6 kg.

THERAPEUTIC INTERVENTION

Emergency treatment included 150 ml Ringer's Lactate bolus, cimetidine 400 mg IV and atropine 1 mg IV. Cardiorespiratory arrest ensued, requiring cardiopulmonary resuscitation with return of spontaneous circulation and respiration after 4 min. A gastric lavage was attempted, but quickly halted due to concerns of aspiration.

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Stabilization continued with atropine 0.02 mg/kg (0.2 mg) every 10–20 min for a total of 1 mg, due to ongoing signs of organophosphate poisoning including miosis, increased secretions and a brief self-terminating seizure.

Within 24 h the child had returned to his normal cognition and was off oxygen. He was discharged home the next day. Attempts to contact the child's family for follow-up were not successful and the mission closed some 6–8 weeks later.

DISCUSSION

Ingestions are common in children. Successful recovery from organophosphate poisoning is based on time from ingestion to initial presentation, rapid stabilization and definitive treatment with atropine.

Recommended atropine dosing is 0.02–0.05 mg/kg repeated every 5–10 min until symptoms resolve. In this case atropine was administered gradually, every 15–20 min, out of concern for adverse reactions with good resolution of signs and symptoms.

Prophylactic diazepam has been suggested in the literature to decrease neurocognitive dysfunction [5]. Although diazepam was not administered to our patient (since the seizure was self-resolving), no immediate neurological concerns were observed. Lessons learned from this case include the importance of prompt identification of the ingested substance, and the need for follow-up to assess for long-term neurological deficits. The unlabeled powder in this case was identified as an organophosphate due to prior similar cases in this health facility and the child's initial presentation (especially increased oral secretions).

Gastric lavages are not recommended as they can cause aspiration.

CONCLUSION

In face of typical symptoms such as those described for our patient, there should be a high suspicion of organophosphate exposure even when the patient or his/her family is not aware of it. Although not used in this case diazepam administration can be considered to decrease complications. Understanding proper

management of ingestion cases is essential for the successful treatment of poisonings, notably in children.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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