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Case Report

When head trauma conceals the cause: status epilepticus due to camphor poisoning

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ABSTRACT

A 2-year-old male child presented with status epilepticus following an accidental fall from the bed. Initial management focused on trauma-related seizures, but further evaluation revealed camphor poisoning as the underlying cause which was identified by the presence of a camphor-like odor in the nasogastric aspirate and confirmed by toxicology. This case underscores the importance of thorough clinical assessment and history-taking in cases of unexplained seizures. The patient was successfully treated with supportive care, including intubation, intravenous anticonvulsants, fluid therapy, and discharged in stable condition. Camphor poisoning, a common but under recognized cause of seizures in children, occurs in areas where camphor-containing products are widely available. The best possible outcomes in a child can only be assured when a condition is detected early and managed promptly as supportive management. Additionally, public health measures should be instituted to regulate and restrict access to camphor in order to prevent accidental poisonings.

Keywords: Status epilepticus, Camphor poisoning, Pediatric toxicology, Accidental ingestion, Anticonvulsants, Misdiagnosed seizures

INTRODUCTION

Several conditions mimic head trauma in children, including non-accidental injuries like metabolic disorders, infections, neurological and hematological causes, poisoning, psychogenic seizures, and other systemic conditions. Camphor toxicity, a less-recognized cause, can lead to seizures and neurological symptoms, often mistaken for head trauma. Camphor, a terpenoid and cyclic ketone, is derived from the wood of *Cinnamomum camphora* or synthesized from turpentine.[1] Widely used in religious rituals, therapeutic balms, skincare, mosquito repellents, and air purifiers. Camphor is also found in disinfectants, hair care, and incense products, reflecting its diverse applications.

CASE REPORT

A 2-year-old male was admitted with status epilepticus after a fall from the bed, presenting with tonic posturing of all 4 limbs, teeth clenching, and shallow respiration, with a Glasgow coma scale score of E1V2M4. Initial management with bag-mask ventilation and intravenous (IV) midazolam was ineffective, requiring IV phenytoin and levetiracetam loading doses, which stabilized the child. Due to shallow respiration, the child was intubated and mechanically ventilated.

A non-contrast CT scan excluded intracranial bleeding, and neurosurgical evaluation showed no abnormalities. Upon further evaluation, a camphor-like odor and particles of the same were detected in the nasogastric aspirate, followed by parents admitted that the child had ingested 1–2 camphor pellets. Toxicology screening confirmed camphor in the gastric aspirate. The child was kept NPO for 24 hours, managed with IV fluids, and extubated after 6 hours. Oxygen support was discontinued within 12 hours. The child remained stable and seizure-free. Child got discharged after 4 days, close

follow up of the case was done and there were no repeat episodes of seizures.

DISCUSSION

Every year, between 9000 and 11,000 cases of camphor exposure are registered in US poison control centres. Approximately 80% of these cases affect children under the age of six due to accidental ingestion.[2] Very rarely does excessive topical application cause toxicity. Most occurrences are mild, but severe complications like refractory seizures, may sometimes be experienced.

Mechanism of action

Camphor modulates TRPV1 and TRPA1 channels, potentially desensitizing cough pathways.[3] In a trial of 138 children, it was found that Vicks Vaporub, containing camphor, reduced cough severity and improved sleep but mild irritation was reported in 46% of those who received the treatment.[4] An overdose of camphor may present neurotoxic symptoms like agitation and seizures, but its mechanism remains a mystery.

Pharmacology

Camphor is quickly absorbed, appearing in blood within 20 minutes of oral ingestion. It is metabolized in the liver, but those infants and fetuses do not have the specific enzymes for hydroxylation and may thus build up rat, resulting in neuronal damage and embryotoxic effects. Patients present with toxic signs within 5-20 minutes of ingestion with maximum effect seen within 90 minutes. Systemic toxicity occurs at doses above 30mg/kg, neurotoxic effects can be seen at doses that exceed 50 mg/kg, while fatal outcomes occur at doses of 500 mg/kg 5. It is neurotoxic, producing neural stimulation and followed by depression.

Uses

Camphor was an earlier starting material in the manufacture of plastics and nitrocellulose lacquers. It has its early marks on medicinal purposes ranging from decongestant to anti-inflammatory effects. As drug therapies in the 20th century for analeptic and psychosis treatment, its topical applications relieve pain and itching, whereas the aerosol form is for respiratory congestion. It also comes in the form of an insect repellent, reduces glare from rifle sights, and acts as a libido depressant. Historically, camphor flavored edibles and perfumes, protected artifacts and had cultural meaning all over Europe, China, Arabia, and India, where edible camphor is used in desserts.[6]

Toxicity

The toxicity of camphor manifests at doses of 15-30 mg/kg and serious cases are observed at doses above 60 mg/kg. The onset of symptoms occurs within 5-90 minutes, including convulsions, nausea and vomiting, abdominal pain, and neurological manifestations such as confusion and lethargy. Normally, this toxicity resolves in 24 hours though seizures may persist. The cause of death is respiratory failure or uncontrolled seizures. The diagnostic yield from laboratory tests is not high, but it may reveal leukocytosis and proteinuria, or increased liver enzymes.[7,8]

Management

Home management of camphor poisoning in children consists of rushing for medical assistance without inducing vomiting, home remedies, or skin washing with soap and lukewarm water, as hot water is avoided. Activated charcoal should not be administered. Gastric emptying with syrup of ipecac is contraindicated.[8]

Observation for symptomatic patients should continue for a minimum of 4 hours. Seizures are managed by benzodiazepines, for refractory seizures, the use of second-line anticonvulsants is indicated. Hospitalization is required for the control of seizures and extracorporeal removal techniques offer little benefit due to the distribution and protein binding of camphor.

Prevention

Preventing camphor poisoning includes putting camphor-containing products safely out from children's reach, raising awareness through parents' education of the risks especially in households with young children, and taking off the shelf OTC camphor products and placing warnings on prescription medications to cause lower accidental exposure.

CONCLUSION

Camphor poisoning, a common but underrecognized cause of seizures in children, occurs in areas where camphor-containing products are widely available. The best possible outcomes in a child can only be assured when a condition is detected early and managed promptly as supportive management. Additionally, public health measures should be instituted to regulate and restrict access to camphor in order to prevent accidental poisonings.

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