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**Study of Demographic and Clinical Profile of Children with  
Indigenous Camphor Exposure Presenting at A Tertiary Care  
Centre**

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## ABSTRACT

**Background:** Small children tend to put everything in the mouth; hence, poisoning due to accidental ingestion of commonly available household toxic substances is quite common in infants and small children. This retrospective study aimed to describe the demographic and clinical profile of children treated following exposure to camphor. **Methods:** A Retrospective descriptive study of children admitted with camphor poisoning from June 2018 to January 2020. The collected data were entered into a tabulated form, and descriptive statistical methods were used. **Results:** Of the 60 children studied, Male infants and toddlers were the most common victims of camphor induced illness. Oral route was the most common mode of exposure. The most common presenting symptom was symptomatic seizures of the generalised tonic-clonic type (91.8%) followed by vomiting and fever. Most patients had seizure onset within 30 minutes of exposure that lasted for 5 to 10 minutes. 39% of those treated, required only a Benzodiazepines. **Conclusion:** Camphor causes neurological symptoms in young children and history of camphor exposure needs to be excluded in all cases of seizures. Ironically, most of them have not required long term AEDs on follow up. Therefore, neuroimaging done has no added benefit in prognosticating long term outcomes in such children.

**Key Words:** Camphor poisoning, seizures

## **Introduction**

Small children tend to put everything in the mouth; hence, poisoning due to accidental ingestion of commonly available household toxic substances is quite common in infants and small children. A wide variety of medications and substances can cause serious illness or kill a child who ingests just a single dose in small quantity. Camphor is one such substance easily available in many Indian households and is not a very well-recognised potentially fatal toxic compound. Camphor, a cyclic ketone is a common household item which causes symptoms of severe poisoning in children even when exposed to in small amounts. It is frequently used as a non-prescription topical antitussive, analgesic, anaesthetic and antipruritic agent. Camphor has a propensity to cause illnesses ranging from innocuous gastrointestinal symptoms to life threatening neurological and terminal events. Around 3-5 mL of 20% camphor oil or > 30 mg/Kg is a potentially lethal dose (Anderson, Topliff, 2001; Narayan, S., and Singh, 2012) To describe the demographic and clinical profile of children treated following exposure to camphor at Sree Balaji medical college and Hospital.

## **Materials and methods**

A Retrospective descriptive study of children admitted with camphor poisoning from June 2018 to January 2020. The collected data were entered into a tabulated form, and descriptive statistical methods were used where applicable.

## **Results and Discussion**

Of the 60 children studied, Male infants and toddlers were the most common victims of camphor induced illness. Oral route was the most common mode of exposure. The most common presenting symptom was symptomatic seizures of the generalised tonic clonic type (91.8%) followed by vomiting and fever. Most patients had seizure onset within 30 minutes of exposure that lasted for 5 to 10 minutes. 39 % of those treated, required only a BZD. Among the study population, 3.28% had Family history of seizures and 6.56% had previous history of seizures. Recurrence of seizures was documented in 17.85% of children and 8.92% children presented with status epilepticus and required ventilation for poor neurological status. Imaging was normal in 98.18% of symptomatic children.

**Table 1: Distribution of study population according to Age**

Age in years	Percent (%)
< 1	5
1 - 3	85
> 3	10

**Table 2: Distribution of study population according to Gender**

Sex	Percent (%)
Male	62
Female	38

**Table 3: Distribution of study population according to route of exposure to camphor**

Route of Exposure	Percent (%)
Inhalational	5
Oral	91
Skin	4

**Table 4: Distribution of study population according to their clinical presentation**

Clinical presentation	Percent (%)
Seizure (GTCS)	91.80
No seizure	8.20

**Table 5: Distribution of study population according to their mode of management**

Mode of management	Percent (%)
Ventilated	8.20
Non ventilated	91.80

**Table 6: Distribution of study population according to number of episode of seizure**

No. of episode of seizure	Percent (%)
Single	82.15
Multiple	17.85

**Table 7: Distribution of study population according to results of neuroimaging**

Neuroimaging	Percent (%)
Normal	98.18
Abnormal	1.82

Camphor is a toxic compound that can prove fatal for infants and children on ingestion even in minimal doses. (Matteucci, 2005). The strong aroma associated with camphor has attracted its use in many oils, inhalants, and ointments, especially as a remedy for the common cold. It is a component of many preparations available over the counter and has a potential for accidental ingestion by infants and small children. Camphor is also an ingredient for many oils and in its solidified form is commonly used in religious events and prayers. In a recent study on the profile of childhood poisoning from a tertiary care centre in North India, the majority of patients (63.9%) were in the 1-3 year age group and kerosene (27.9%), drugs (19.8%), and insecticides (11.7%) were the agents most frequently implicated (Kohli et al., 2008).

The site of action of camphor is supposed to be intra-neuronal and on the oxidation cycle at a phase above the flavoprotein cytochrome-b level of the cytochrome oxidase system. This has been supported by post-mortem changes of severe anoxia in the neurons (Smith, Margolis, 1954). With significant ingestion of camphor (>50 mg/Kg body weight) neurologic toxicity is common, with generalised tonic clonic activity being the most prominent manifestation occurring variably from five minutes to 90 minutes after exposure (Aggarwal, Malhotra, 2008). Symptoms appear rapidly after ingestion and seizures have been reported after the ingestion of camphor in 6% of cases. (Goel, Aggarwal, 2007). Patients usually present with severe nausea, vomiting, lethargy, ataxia, and convulsions. Patients who have ingested > 30 mg/Kg of a camphor-containing product or who are exhibiting symptoms of moderate to severe toxicity (e.g. convulsions, lethargy, ataxia, severe nausea, and vomiting) by any route of exposure should be referred to an emergency department for observation and treatment.

Management of camphor toxicity must begin by stabilizing the airway, continuous monitoring of heart rate, respiratory rate, and pulse oximetry, followed by decontaminating skin using soap and lukewarm water. Seizures caused by camphor poisoning occur primarily soon after ingestion, maximally before first 2 h. Seizures must be treated with short-acting benzodiazepines, preferred agents being intravenous midazolam and lorazepam (Manoguerra et al., 2006) and repeat doses may be administered if necessary. For uncontrolled seizures, a second anticonvulsant may be administered such as phenobarbital or phenytoin. Refractory

seizures may require additional drugs such as continuous infusions of midazolam and propofol. Children require ICU admission and observation for a minimum of 2 days in the event of seizure. Seizure recurrences are infrequent after initial recovery, and prophylactic anticonvulsants are rarely indicated.

Camphor is rapidly absorbed after ingestion from the gastrointestinal tract; hence, neither activated charcoal nor gastric lavage is helpful. Haemodialysis may be the last resort in case of severe renal impairment or severe toxicity. The American Association of Poison Control Centre does not therefore recommend either activated charcoal or gastric lavage for camphor poisoning (Manoguerra et al., 2006) Induction of emesis should not be performed. For asymptomatic patients with topical exposures to camphor products, the skin should be thoroughly washed with soap and water and the patient can be observed at home for development of symptoms (Manoguerra et al., 2006).

A benzodiazepine should be used to control convulsions and patients who have been exposed to a camphor product and patients who remain asymptomatic after four hours can be safely observed at home. Since, camphor is easily available in many Indian house-holds for religious purposes (each tablet may contain up to a few grams of camphor), parent education regarding this toxic and potentially fatal compound and keeping them away from easy access to children is very important for preventing camphor poisoning. Camphor poisoning should be considered a cause of seizure in otherwise healthy children and parents should be asked about a possible ingestion of camphor products in the preceding few hours (Manoguerra et al., 2006).

## **Conclusion**

Camphor causes neurological symptoms in young children and history of camphor exposure needs to be excluded in all cases of seizures. Ironically, most of them did not require long term Anticonvulsants on follow up. Therefore, neuroimaging done has no added benefit in prognosticating long term outcome in such children.

## **Author contribution**

Jayakanthan S, Manimaran R, Sathyanarayanan M, Bharathi Raja K encouraged and supervised the findings of this work. All authors discussed the results and contributed to the final manuscript

## **Acknowledgement**

**Conflict of interest:** Nil

## Study significance

Camphor poisoning should be considered a cause of seizure in otherwise healthy children and parents should be asked about a possible ingestion of camphor products in the preceding few hours.

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