

Unique Case with Seizures after Prolonged Use of Camphor Crème in Elderly Patient

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Abstract

Camphor is a pleasant smelling cyclic ketone of the hydro aromatic terpene group. The mechanism by which camphor produces toxicity is unknown. Within a period of 5 to 15 minutes, patients commonly complain of mucus membrane irritation, nausea, vomiting, and abdominal pain. Generalized tonic-clonic convulsions are often the first sign of significant toxicity and can occur soon after ingestion. Central nervous system depression is commonly seen, such as headache, dizziness, confusion, agitation, anxiety, hallucinations, myoclonus, and hyperreflexia.

The aim of the study is to show a unique case of generalized tonic-clonic convulsions, after 1 week of dermal applications of camphor crème in elderly patient.

Case Report

66-year old female was brought to the University Clinic for Toxicology in Skopje, with status epilepticus, after several generalized tonic-clonic seizures. At arrival, the patient was somnolent, with heavy headache, hypotensive (14/9 kPa), with partial amnesia, relax muscles, small amount of blood in mouth and specific odour. Five minutes later, during standard examination, the patient developed another generalized tonic-clonic seizure. An amount of 10 ml i.v. diazepam was applied to stabilize the patient, and a few minutes later the patient woke up. Heteroanamnesis taken from her husband showed that she had another similar convulsion ten days ago. EEG, CT and MRI made previously, did not show any abnormalities. The specific smelt, repeated seizures and especially the dermal application of Kamfart crème, made the suspicion of poisoning with camphor. The toxicological examination showed a positive result. After excluding the camphor crème, the patient didn't manifest any seizures.

Keywords: Camphor; Poisoning; Seizures

Introduction

Camphor is a pleasant smelling cyclic ketone of the hydro aromatic terpene group. Its history dates to ancient Chinese medicine and has been used as an aphrodisiac, anti-aphrodisiac, contraceptive, abortifacient and suppressor of lactation [1]. It was originally obtained with distillation of bark chips from the camphor tree *Cinnamomum camphora*; nowadays it is synthesized chemically and used in cold remedies [1,2], but today is produced synthetically from turpentine. It has a characteristic, penetrating odour and a pungent, aromatic taste [3].

Camphor is a cyclic ketone in the hydroaromatic terpene group (figure 1). Once absorbed, it is oxygenated to produce the alcohol campherol which is then conjugated in liver with glucuronic acid to become soluble in water. Most camphor is ultimately excreted in the urine. Camphor crosses the placental barrier which accounts for its embryotoxic effects. In every day usage, camphor is found in a variety of non-prescription products, either alone or in combination with other ingredients. It can also be purchased, particularly in shops providing alternative medications. Pharmaceutical products currently available on our market have camphor concentrations ranging from 0.5% to 10.8%, but there are also possibilities to find more concentrated products. Since 1983, medical products in the USA must contain <11% camphor [4]. In



Cinnamomum camphora

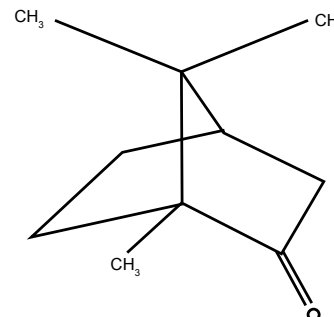


Figure 1: Molecular structure of camphor.

France the regulation is less precise. Camphor is a frequently used industrial product, particularly in many cosmetics products. Drugs containing camphor are prohibited for use in children, younger than 30 months of age, but few cosmetics containing camphor are on free access.

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Therapeutic use

Germany's Commission E has approved camphor for the treatment of rheumatism (externally), hypotension, arrhythmia, cough, bronchitis and nervous heart complaints [5,6]. Camphor oil preparations have been used both internally and externally in many countries, for a variety of ailments, ranging from respiratory problems to rheumatic pain [7-9]. The principal use of camphor is as an antitussive agent reducing coughs. The plant contains substances called mucilage (hydrophilic colloids) which upon contact with water form viscous solutions that form a protective layer covering the upper respiratory system lining, thus reducing mechanical irritation and preventing the cough reflex [10]. The essential oil is diluted in a suitable carrier (almond oil, for example) and employed as topically as rubefacient (to improve capillary circulation), and raises the blood pressure. The vapours are inhaled as treatment for upper respiratory tract. Infusions or teas may be taken internally as expectorants, although this form of application is not recommended due to camphor potential toxicity, since the therapeutic dose approximates the toxic dose. Camphor oil is applied to the skin as a rubefacient to promote circulation [11].

The mechanism by which camphor produces toxicity is unknown. Nevertheless, young children seem particularly exposed due to lack of the enzymes to hydroxylate and conjugate camphor that lead to accumulation of neurotoxic substances. Absorption from the gastrointestinal tract occurs rapidly with detectable serum concentrations found within minutes after ingestion [12]. Within a period of 5 to 15 minutes, patients commonly complain of mucus membrane irritation, nausea, vomiting, and abdominal pain. Generalized tonic-clonic convulsions are often the first sign of significant toxicity and can occur soon after ingestion [13]. Central nervous system depression is commonly seen, such as headache, dizziness, confusion, agitation, anxiety, hallucinations, myoclonus, and hyperreflexia. Death is usually the result of respiratory failure or convulsions. Even when applied to the skin in large quantities, camphor has only rarely been reported to cause systemic poisoning resembling the effects seen with acute ingestion exposures [14]. Chronic oral camphor administration has been reported to cause death [15], while chronic, low-dose, dermal exposure over many years was reported to cause granulomatous hepatitis in one case [16]. There is no specific antidote to camphor poisoning, so it is treated symptomatically. Benzodiazepines are generally recommended as initial seizure treatment

Aim of the Study

Is to show a unique case of generalized tonic-clonic convulsions, after 1 week dermal camphor crème application in elderly patient.

Case report

A 66-year old female was brought to the University Clinic for Toxicology in Skopje, by emergency car and staff, as Status Epilepticus, after several generalized tonic-clonic seizures. At arrival, the patient was somnolent, with heavy headache, hypotensive (14/9 kPa), with partial amnesia, relax muscles, small amount of blood in mouth and specific odour. Five minutes later, during standard examination the patient developed another generalized tonic-clonic seizure. An amount of 10 ml i.v. diazepam was applied to stabilize the patients, and few minutes later the patient woke up. Heteroanamnesis taken from her husband showed that she had another similar convulsion ten days ago, when she had been admitted to the University Clinic for Neurology. EEG, CT and MRI made previously did not show any abnormalities.

Specific smelt, repeated convulsions and specially the rheumatism

in the last month, treated with local dermal application of Kamfart crème-Bosnalijek (Camphor 40% + Menthol 20%) three times a day, made the suspicion of poisoning with camphor. The further toxicological blood examination showed a positive result for camphor. The next 24 h, the patient was treated with glucose infusions, high doses of pyridoxine and diazepam and 36 h after arriving, she was discharge from the Clinic. After excluding the camphor crème, in the next six months, the patient did not manifest any seizures.

Discussion

The major manifestations of camphor intoxication, after ingestion, involve the gastrointestinal tract. Severe poisonings are characterised by neurological symptoms including irritability, hyperreflexia, tonic muscular contraction and seizures.

The exact mechanism of camphor induced seizure activity is unknown. Nevertheless, young children seem particularly exposed due to lack of enzymes to hydroxylate and conjugate camphor that lead to accumulation of neurotoxic substances. Clinical toxicity generally resolves within 24 h. Seizures may persist for up to 24 h but this does not necessarily portend a poor prognosis. Death results from respiratory depression or as a complication of status epilepticus [17].

Even when applied to the skin in large quantities, camphor has only rarely been reported to cause systemic poisoning resembling the effects seen with acute ingestion exposures [18,19]. Guilbert showed a case of 4-month healthy baby with seizures after it was given an abdominal massage by his nanny with a solution of camphor, reported to have anti-flatulence effects. Other case report described a 15-month-old boy who crawled through a puddle of spilled camphor spirits. He developed ataxia followed by generalized convulsions that persisted for 2 days despite phenobarbital administration. He had no further convulsions until 1 year later when he was exposed to a 4.8% camphorated vaporizer solution to relieve the symptoms of an acute upper respiratory illness. He developed a single, generalized major motor convulsion. He received phenobarbital, which was discontinued after 5 years with no further convulsions [20]. Summers described a 25-month-old boy with an upper respiratory illness who developed delirium, visual hallucinations, and urinary incontinence after his chest was "soaked in" more than 1 ounce of camphorated oil for 80 hours. The product contained 6.4 g camphor per ounce [19]. Joly et al. described a 9-month-old girl with a 20% body surface area scald burn who was treated with dermal application of a camphorated dressing (9.6 g camphor/100 g dressing) for 24 hours and developed severe toxicity, including convulsions. They estimated that she had been exposed to 15 g camphor [21]. A 48-year-old woman developed severe toxicity with convulsions after using a Vicks Inhaler (containing L-desoxyephedrine, menthol, camphor, and pine oil in unspecified amounts) every 30 minutes for approximately 8 hours. She had also ingested by nasal instillation approximately 3.75 mL of Vicks Va-Tro-Nol nasal drops (containing menthol, eucalyptol, camphor, ephedrine, and methyl salicylate in unspecified amounts) in the hour before developing symptoms [22]. McCollam et al. described a case report in which a 72-year-old woman developed granulomatous hepatitis following repeated dermal application of five containers of Vicks VapoRub Ointment over a 5-year period. Following discontinuation of the product, she improved and the problem appeared to be resolving at the time of the report [22]. In a prospective volunteer study, 24 healthy adult male and female volunteers were randomly assigned to one of three dosage groups: 2, 4, or 8 Satogesic Medicated Adhesive Patches. Each patch contained 46.8 mg camphor 4 mg menthol, and 74.88 mg methyl salicylate. Blood samples were drawn at regular intervals. The

study found that at these doses and with this dosage form, dermal absorption of camphor was low [22].

Conclusion

According to our knowledge and all available recourses, our case is the only reported, in which an elder patient developed seizures after dermal application of camphor crème. All made clinical investigation, did not find any other trigger for this unexpected life threatening situation. Camphor is potentially convulsive substance, and we must have this in mind, when we do not find any reasonable explanation for undefined seizures and convulsions.

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