Case Report

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An Uncommon Complication of Essential Oil Poisoning in Adult: Case Report

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Abstract

Eucalyptus oil is a versatile essential oil derived from the leaves of the eucalyptus tree, primarily Eucalyptus globulus. Known for its strong, fresh, and distinctive aroma, eucalyptus oil has many applications in health, wellness and in household uses. While eucalyptus oil has many health benefits, it can pose health complications if not used properly. Early recognition and timely management are more important to avoid complications. Here is a case of eucalyptus oil-induced Rhabdomyolysis in young adult.

Keywords: Rhabdomyolysis; Eucalyptus oil; Essential Oil.

INTRODUCTION

Eucalyptus oil, derived from the leaves of Eucalyptus trees, is commonly used for its medicinal properties, including anti-inflammatory, antimicrobial, and decongestant effects. Despite its therapeutic benefits, eucalyptus oil can be toxic if ingested or improperly applied, particularly in large doses or by vulnerable populations such as children and pets.[1]

The primary component of eucalyptus oil is 1,8-cineole (eucalyptol), which is responsible for its characteristic aroma and therapeutic properties. Other components include alpha-pinene, limonene, and globulol. The concentration of these compounds can vary depending on the species of Eucalyptus and the method of oil extraction.[1]

Eucalyptus oil toxicity primarily affects the central nervous system and gastrointestinal tract. The main toxic effects are attributed to the 1,8-cineole compound. When ingested or absorbed through the skin in large amounts, it can cause a range of symptoms from mild to severe.

While eucalyptus oil has many beneficial uses, it is crucial to be aware of its potential toxicity. Proper usage and storage can prevent most incidents of toxicity. In case of suspected eucalyptus oil poisoning, seek medical help immediately. Understanding the symptoms and mechanisms of toxicity can lead to prompt and effective treatment, minimizing the risk of severe health outcomes.[2]

CASE

A 25-year-old female with no comorbidities was brought to the Emergency Department around 20th March 2024 with complaints of involuntary movements of upper and lower limbs associated

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with drooling of saliva which lasted for 1-2 minutes and resolved spontaneously.

On primary survey, the patient was drowsy with GCS of E3V4M5, BP- 110/60mmHg, PR 96/min, SpO_2-90% on Room Air, GRBS-185mg/dl, pupils bilateral equal and reactive to light. She was started oxygen by face mask with 6L/min O_2 and IV crystalloid at 100ml/hour. During resuscitation, patient developed another episode of tonic-clonic convulsions for which Benzodiazepine (Inj. Lorazepam 4mg) iv was given following which the seizure terminated and the patient went into Postictal phase.

On secondary survey, the patient's relative revealed alleged H/O consumption of 30ml of Eucalyptus Oil around 07:00Amon the same day (Fig. 1). No H/o fever/vomiting/headache/trauma/ allergies or significant medical, past, and personal histories noted. LMP on 9/3/2023, regular, and uneventful.

Fig. 1: A bottle containing eucalyptus oil

On regaining consciousness, after ruling out any potential threat to the airway, the patient was given gastric lavage. ECG was sinus tachycardia with a rate of 140/min, Arterial blood gas normal, and Urine pregnancy test negative. Routine laboratory investigations were sent and shifted to Intensive care unit where symptomatic treatment started. On Day 2, patient was hemodynamically stable and found to have high-colored urine in rounds (Fig. 2). In lab investigations, ABG showed metabolic acidosis and creatinine kinase MB which was 7800, provisionally suspected Rhabdomyolysis and started IV crystalloid at 200ml/hour along with diuretics (Inj. Furosemide 20mg BD) and corticosteroids (Inj. Hydrocortisone 100mg TID). Repeat CPK MB on the same day increased to 10000 and urine myoglobin was present (Table 1).

Fig. 2: Cola-colored urine

IV crystalloids increased to 250ml/hour and Inj. Sodium Bicarbonate 1meq/kg given. Day 3, Patient had no fresh complaints but CPK showed 20563 for which IV crystalloids were increased to 300ml/hour and Inj. Sodium Bicarbonate dose was repeated. Nephrologist opinion was obtained and advised no hemodialysis. On day 4, patient had no fresh complaints and was hemodynamically stable with CPK of 3035. Urine output Improved and metabolic acidosis had resolved. Patient was shifted to ward and psychiatric counseling was done. On further evaluation, patient showed steady improvement clinically and was discharged on 7th day.

Table 1: Laboratory investigations trends

Investigations	Day 1	Day 2	Day 3	Day 4	Day 5
HB	10.9	NA	NA	10.9	11
TC	9.57	NA	NA	7.69	7.69

Table Cont...

PLT (lakhs)	NA	NA	NA	2.51	2.51
UREA	16	NA	NA	8	10
Creatinine	0.4	NA	NA	0.5	0.5
NA^+	142	NA	140	141	141
K^+	3.9		3.4	3.1	3.1
Cl^-	113		109	102	102
CPK	NA	7800	20563	3035	
Urine input/output	1800/1500	2000/1800	3600/2400	3900/2800	2800/2680

NA-Not Assessed CPK- Creatine Phosphokinase HB-Hemoglobin TC- Total Count

DISCUSSION

Essential oils EO are organic compounds obtained from plants or their parts and have been used for the common cold and to relieve sinus congestion in both young and old. The word "essential" is a misnomer and does not mean it is "essential" to humans but indicates that it is the essence or concentration of a plant or one of its parts.[3] The main group of constituents of EO is monoterpenes, and the principal constituent of pharmaceutical-grade EO is 1, 8-cineole (eucalyptol), which must comprise at least 70% of the contents.[4]

Plant-derived essential oils such as EO have been known to have epileptogenic properties when they have been used for therapeutic purposes. The toxic dose varies but amounts from 0,5 ml/kg onwards for lavender oil and 0,2 ml/kg for eucalyptus oil can cause severe toxicity in adults (for children 0,5 ml/kg and 0,4 ml/kg). Initial effects include a burning sensation in the mouth and throat, vomiting, and diarrhea. Convulsions, central nervous system depression, rhabdomyolysis, and hepatic and renal failure may occur in severe cases.[5]

EO poisoning is most frequently reported in children who accidentally ingest it, and its neurotoxic effects are well-documented.[6]

Eucalyptus oil contains compounds such as cineole (eucalyptol) which, in high doses, have been implicated in causing muscle toxicity. These compounds can disrupt cell membranes and interfere with cellular metabolism. Metabolic byproducts of eucalyptus oil can induce oxidative stress, damaging muscle cell membranes and leading to cell lysis. The interference with mitochondrial function can result in energy depletion within muscle cells, causing cell death and subsequent release of muscle cell contents.[7]

Rhabdomyolysis is a medical condition characterized by the breakdown of muscle tissue, leading to the release of intracellular components such as myoglobin, creatine kinase (CK), and electrolytes into the bloodstream. This can result in acute kidney injury, electrolyte imbalances, and disseminated intravascular coagulation (DIC).[8] Management of rhabdomyolysis should include continuous assessment of airway, breathing, and circulation, frequent examinations, and appropriate hydration to improve end-organ perfusion. Loop diuretics can be considered in the setting of oliguric or anuric, even with aggressive fluid resuscitation.[9] Literature review shows that there are only four cases in which intravenous corticosteroid use is administered in the treatment of rhabdomyolysis. The rationale for steroids in these cases is that the muscle necrosis in rhabdomyolysis has a significant inflammatory element, which is supported by the successful reduction of CK levels after the administration of IV Methylprednisolone.[10]

CONCLUSION

This case describes the Rhabdomyolysis is uncommon but fatal complication of essential/eucalyptus Oil and the importance of disseminating this information among the health care workers to early recognition and management.

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