



Case Report

Acute symptomatic seizure following eucalyptus oil inhalation: An uncommon provoking factor often ignored

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ABSTRACT

Eucalyptus oil is a commonly used over the counter home remedy for ailments like common cold and sinusitis. Although considered very safe adverse effects are infrequently reported partly due to poor awareness. We report an interesting adult patient who developed first episode of generalized tonic-clonic seizure immediately following inhalation of eucalyptus oil.

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1. Introduction

Eucalyptus oil is a commonly used essential oil as over the counter remedy for common cold and other respiratory tract infections. Although plant derived essential oils are considered very safe and effective potential adverse effects including seizures are known to occur.¹ Here we report an interesting patient who developed first time seizure immediately following inhalation of eucalyptus oil.

2. Case History

A 48-year-old lady was brought to the emergency department with the history of one episode of generalized tonic clonic seizure lasting for two to three minutes followed by altered sensorium. Attendant reported that she was inhaling the eucalyptus oil mixed hot water vapour just before the seizure onset. No history of fever but she had common cold on that day however did not use any other medication. She regained normal sensorium in 15 minutes and confirmed the history and admitted that she did not have direct exposure to the similar compounds in the past. No past history or family history of seizures.

On examination she had tongue bite, obeying commands, no focal neurological deficits or neck stiffness noticed. Vitals were temperature 99 F, pulse rate of 110/min regular, blood pressure 130/80mm hg, respiratory rate of 24/min. General, cardiovascular and respiratory system examination was unremarkable.

Laboratory evaluation revealed Hemoglobin of 13gr/dl, total leucocyte count 9000/cumm, Random blood sugar 98mg/dl, serum creatinine 0.8mg/dl. Serum electrolytes, calcium, magnesium, liver function tests, ECG, chest X ray were normal. Magnetic Resonance Imaging of brain and Cerebro spinal fluid analysis were normal. EEG done on day two of admission did not show any significant abnormality.

She was started on intravenous levetiracetam 1000mg loading dose followed by 500mg twice a day. Two days of hospital stay was uneventful and was discharged on tab levetiracetam 500mg twice a day and advised not to use essential oils and other compounds known to trigger seizures. During follow-up levetiracetam was stopped and over next one year she did not have any further seizures.

3. Discussion

Eucalyptus oil is the distilled volatile aromatic constituent of the leaf of eucalyptus. Global production is dominated

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by Eucalyptus globulus. Eucalyptol (1,8 cineole) which is oxygenated monoterpene constitutes the major fraction, other components include fenchone, alpha terpinolene and beta terpinyl acetate.² In children accidental ingestion is the primary mode of exposure with few reports describing inhalation and spectrum of neurological complications include seizures, status epilepticus, ataxia and encephalopathy. Typical interval between the exposure and the complications is few minutes to hours.^{3,4} In adults steam inhalation of eucalyptus oil is common and generalized tonic clonic seizures, complex partial seizures are known to occur rapidly with a latent period of only few minutes.⁵ Rarely dermal application also can induce similar adverse effects. Rapid onset of seizures following inhalation is likely due to direct entry to the brain. Proposed pathophysiological mechanism described in animal models include increased cellular hyper excitability secondary to protein kinase A mediated inhibition of potassium ion channels resulting in loss of Na/K gradient across the cell membranes.⁶ In our patient the mode of exposure, latency between exposure and seizure, semiology of seizure and recovery are comparable to the existing literature.⁵ However majority of the previous reports included much younger subjects. First exposure or higher dose in previously exposed individuals may induce seizure. Larger epidemiological studies are required to find out dose dependent complications. Due to poor awareness in general public, non availability of proper labeling of various complications on different eucalyptus oil brands patients may not reveal this specific point in history. In case of recurrent seizures, physicians are generally trained to look for a trigger factor such as infectious disease, sleep deprivation or recent medication change. Hence health care professionals should specifically enquire about the exposure to essential oils in all the cases of new onset seizures or breakthrough seizures. This may avoid wrong diagnosis of febrile seizures, idiopathic epilepsy and unnecessary prescription of long term antiepileptic medication in individuals with definite history of preceding exposure to essential oils including eucalyptus oil.

4. Conclusion

Although very rare seizures can occur following eucalyptus oil inhalation. Awareness of this potential complication among the treating physicians and the patients helps in the timely diagnosis and appropriate management. Community level education programs and proper labelling regarding potential adverse effects of commonly used over the counter home remedies needs to be encouraged.

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6. Conflict of Interest

None.

References

1. Vigan M. Essential oils: renewal of interest and toxicity. *Eur J Dermatol.* 2010;20(6):685–92.
2. Dhakad AK, Pandey VV, Beg S, Rawat JM, Singh A. Biological, medicinal and toxicological significance of Eucalyptus leaf essential oil: a review: Biological, medicinal and toxicological significance of Eucalyptus leaf essential oil. *J Sci Food Agric.* 2018;98(3):833–8.
3. Kasinathan A, Sharawat IK. Plant Oil Inhalation Induced Seizures: A Less Known Entity. *Indian J Pediatr.* 2020;87(5):398.
4. Kumar K, Sonnathi S, Anitha C, Santhoshkumar M. Eucalyptus oil poisoning. *Toxicol Int.* 2015;22(1):170–1.
5. Mathew T, Kamath V, Kumar RS, Srinivas M, Hareesh P, Jadav R, et al. Eucalyptus oil inhalation-induced seizure: A novel, underrecognized, preventable cause of acute symptomatic seizure. *Epilepsia Open.* 2017;2(3):350–4.
6. Zeraatpisheh Z, Vatanparast J. Eucalyptol induces hyperexcitability and epileptiform activity in snail neurons by inhibiting potassium channels. *Eur J Pharmacol.* 2015;764:70–8.

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