

EUCALYPTUS INDUCED SEIZURES – A CASE REPORT

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Introduction

Eucalyptus is a diverse genus of flowering trees and shrubs in the myrtle family, Myrtaceae. Members of the genus dominate the tree flora of Australia, and include *Eucalyptus regnans*, the tallest known flowering plant on Earth. There are more than 700 species of eucalyptus and most are the native of Australia. A mature eucalyptus may take the form of a low shrub or a very large tree. Eucalyptus oil (EO) is extracted from these leaves and is an essential oil that is widely used across the globe as an over-the-counter remedy for common ailments. (Bennett, 2010)

Other Names

Blue Gum, Blue Mallee, Blue Mallee Oil, Eucalipto, *Eucalypti Folium*, Eucalyptol, Eucalyptol Oil, *Eucalyptus blatter*, *Eucalyptus bicostata*, Eucalyptus Essential Oil, Eucalyptus Oil, *Eucalyptus fructicetorum*, *Eucalyptus globulus*, Eucalyptus Leaf.

Composition of Eucalyptus

All eucalyptus oils (EO) are composed of complex mixtures of volatile organic compounds. The main group of constituents of EO is monoterpenes, and the principal constituent of pharmaceutical-grade EO is 1, 8-cineole (eucalyptol), which comprises of at least 70% of the contents. The composition of the extracted oil can change depending on the storage conditions of the raw

material and the technique employed to extract the oil. Plant-derived essential oils such as EO have been known to have epileptogenic properties when they have been used for therapeutic purposes. (Lindsey, 2016.)



Basic Description of Eucalyptus

Part of Plant used: Leaves and mature branches.

Extraction method: Distillation.

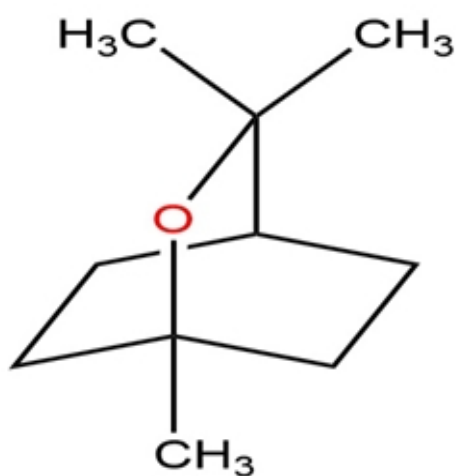
Oil yield: 1-3%

Color of Oil: Pale yellow to clear.

Odor Description: Strong, camphor like, balsamic, fresh.

Chemical Composition

Chemical Feature: Rich in the oxide 1,8 cineole syn eucalyptol and monoterpenes.



Eucalyptol

- 1, 8 cineole syn. eucalyptol or cajepulol is an oxide and an ether. The name 1,8 refers to the fact that the oxygen atom is bonded to the first and eighth carbon atoms.

Action of Eucalyptus oil

- Anti-inflammatory.
- Antispasmodic.
- Decongestant.
- Deodorant.
- Disinfectant.
- Antiseptic.
- Antibacterial.
- Insecticidal.
- Stimulant.

Method of Administration

- Inhale Directly.
- Apply topically.
- Spray.
- Body compress.
- Inhale Directly.
- Fevers rub.
- Forehead compress.
- Oil massage.
- Oil bath.
- Steam inhalation.

Benefits of Eucalyptus oil.

1. Cold and congestion.
2. Cough.
3. Hair nourishment.
4. Itchy scalp.
5. For lice.
6. Keeping the bugs away.
7. Cold sores.
8. For diabetes.
9. Reducing fever.
10. Sinus.
11. For asthma.
12. Building immunity.
13. For skin, as antifungal.
14. Acne.
15. For cleaning and deodorizing.
16. Removes mental exhaustion.
17. Dental Care.
18. Removes intestinal germs.

10. Bad breath.
11. Relieves joint pain and arthritis.
12. For muscle pain.
22. Used as Soap.
23. Treats Tuberculosis & Pneumonia
24. Aromatherapy

Mode of Preparation

Eucalyptus products can generally be used safely on the skin, as long as the oil is diluted. It should not be applied directly onto the skin until it is diluted with a carrier oil, such as olive oil. The dilution should be between 1 percent and 5 percent eucalyptus oil to between 95 percent and 99 percent carrier oil; this equates to roughly one to five drops of essential oil in an ounce of carrier oil.

Eucalyptus can produce irritation and a burning sensation. It should not be used too close to the eyes.

Precautions and Side effects

- Allergies can develop over time. If you have used eucalyptus oil in the past and now seem to be having an allergic reaction to it, discontinue use.
- It is **not safe** to take eucalyptus oil orally because it is poisonous.
- In some individuals with asthma, eucalyptus can make their condition worse. Others find that it helps to relieve their asthma symptoms.
- Other side effects may include: diarrhea, nausea, vomiting, and stomach upset.
- Children are more sensitive to essential oils, so care should be taken when using eucalyptus with children. Use should be avoided during pregnancy.
- If it's found in a scent, be sure that it is used and stored where children can't find it.
- If it's in a medicine, use according to label instructions ONLY.
- If, for some reason, you have bottles of essential oils at home, consider discarding them (safely) if you have young children. Otherwise, they **MUST** be locked up, out of sight and reach of children and pets – all the time.

Signs of Eucalyptus Poisoning

- Eucalyptus oil, when taken in more quantities than prescribed, can be toxic.
- In large doses, eucalyptus oil can cause stomach pain, seizures and increased pulse rate.
- If swallowed, eucalyptus oil can cause seizures.
- Dizziness, feelings of suffocation, and small

pupils. It is important to note that eucalyptus may interact with other medications and can impact the liver.

Case Report

A 49-year-old man had symptoms of common cold and nasal congestion. During such episodes, he usually takes eucalyptus oil inhalation. On one such incident, he had put few drops of eucalyptus oil in a bowl of water and was inhaling the steam for about 5 minutes.



The inhalations were very rigorous. After a few minutes he suddenly fell to the floor and had tonic posturing of all four limbs followed by clonic movements for 1 minute. He had postictal confusion for 15 – 20 minutes denying that anything had ever happened. He had no seizures in the past. There was no history of febrile seizures in his childhood or any family history of seizures. He also had a lateral tongue bite.

Medical Management

He was brought to the emergency room, where he received intravenous levetiracetam 1,000 mg. His brain MRI was normal. EEG was also normal. He was given levetiracetam 500 mg twice daily for 2 weeks. After 1 month of follow-up, he was found to be asymptomatic. After 3 months of follow-up, he was found to be doing well with no recurrence of seizures.

Nursing Management

Nursing Assessment

- Obtained seizure history, including prodromal signs and symptoms, seizure

behavior, postictal state, history of status epilepticus.

- Documented the following about seizure activity
 - Circumstances before attack, such as visual, auditory, olfactory, or tactile stimuli; emotional or psychological disturbances; sleep; hyperventilation was assessed.
 - Description of movement, including where movement or stiffness started; type of movement and parts involved; progression of movement; whether beginning of seizure was witnessed
 - Position of the eyes and head; size of pupils.
 - Presence of automatisms, such as lip smacking or repeated swallowing.
 - Incontinence of urine or feces.
 - Duration of each phase of the attack.

- Presence of unconsciousness and its duration
- Behavior after attack, including inability to speak, any weakness or paralysis (Todd's paralysis), sleep.
- Investigated the psychosocial effect of seizures.
- Obtained history of drug or alcohol abuse.

Nursing Diagnoses

- Ineffective breathing pattern related to neuromuscular impairment secondary to prolonged tonic phase of seizure or during postictal period as evidenced by abnormal respiratory rate, rhythm, and or depth.
 - **Nursing Goal :** Normal breathing pattern adequate to meet oxygen needs.
- Ineffective Tissue Perfusion (cerebral) related to seizure activity.
 - **Nursing goal :** Maintaining Cerebral Tissue Perfusion.
- Risk for Injury related to seizure activity
 - **Nursing Goal :** Preventing Injury.
- Ineffective Coping related to psychosocial and economic consequences of epilepsy.
 - **Nursing Goal:** Strengthening Coping.
- **Nursing Interventions**
- Monitor ed respiratory and oxygenation status to determine presence and extend of problem and to initiate appropriate interventions.
- Positioned patient (side lying) to maximize ventilation potential.
- Protected the patient's head from banging on the floor while the convulsive movements are occurring, and loosened any tight clothing.
- Did not force anything into the patient's mouth as this could damage teeth and gums.
- Continued observation.

- Checked the sleeping patient every few minutes, observing the breathing pattern and the level of consciousness. It is not necessary to waken the patient every few minutes; a touch on the arm or shoulder and calling the person's name should be enough to elicit a groan or similar noise that will indicate the patient is rousable.
- Perform endotracheal or nasotracheal suctioning to maintain airway as needed.

Seizure management

- Loosened clothing to prevent restricted breathing.
- Applied oxygen as appropriate to maintain oxygenation and prevent hypoxia.
- Maintained a patent airway until patient is fully awake after a seizure.
- Provided oxygen during the seizure if cyanotic changes occurs.
- Stressed the importance of taking medications regularly.
- Provided a safe environment by padding side rails and removing clutter which may be harmful to the patient.
- Monitored compliance in taking antiseizure medications to determine risk for seizure.
- Kept suction, ambu bag, mouth piece at the bedside to maintain airway and oxygenation if needed.
- Placed the bed in a low position.
- Did not restrain the patient during a seizure.
- Did not put anything in the patient's mouth during a seizure.
- Placed the patient on side during a seizure to prevent aspiration.
- Protected the patient's head during a seizure. If seizure occurs while ambulating from chair, cradle head, provided cushion/support for protection against head injury.

Patient Education and Health Maintenance

- Assessed home environment for safety hazards in case the patient falls, such as crowded furniture arrangement, sharp edges on tables, glass. Soft flooring and furniture and padded surfaces may be necessary.
- Supported patient in discussion about seizures with employer, school, and so forth
- Encouraged the patient to determine existence of trigger factors for seizures (eg, skipped meals, lack of sleep, emotional stress.).
- Encouraged the patient and family to discuss feelings and attitudes about epilepsy.
- Encouraged a moderate lifestyle that includes exercise, mental activity, and nutritional diet

Discussion

Thomas (2017) found that 3 healthy patients, two adults and one child, who suffered from an isolated generalized tonic-clonic seizure and a generalized tonic status, related to the absorption of this oil for therapeutic purposes. No other cause of epilepsy was found, and outcome was good in the two adult cases, but the course has been less favorable in the child. An adverse reaction report received recently in New Zealand describes vomiting, lethargy and ataxia followed by a grand mal seizure in a 4-year-old girl who was treated with an over-the-counter head lice treatment containing eucalyptus oil.

Thomas (2017) stated that, although there have been no explicit studies outlining the mechanism by which essential oils/eucalyptus oils can precipitate seizures, studies on rat models show it may be secondary to loss of tissue sodium/potassium gradient leading to increased cellular hyperexcitability. EOIS (Eucalyptus Oil Induced Seizure) may be reported so rarely in the literature because of lack of awareness among patients. Therefore, the knowledge that EO can induce seizure must be disseminated among healthcare professionals and the public so that such

practices as consuming, applying, or inhaling EO in any form may be avoided. The relationship of EO and seizures needs to be further explored in future studies. Most authors agree that given that 1,8-cineole is a CNS depressant, and that most ingestion-induced seizures come from ingestion or inhalation of large quantities, eucalyptus oil may not represent a general seizure risk in all populations but just in large quantities in small children.

Conclusion

Although essential oils have been used to treat coughs due to colds, reports in the literature document reveal that they can be harmful when inhaled or ingested. Parents and caregivers should be aware of the life-threatening risks of inhalation and ingestion. Because these products are readily available and inexpensive, consumer education and awareness, educating parents, caregivers and the public about the risks involved in exposure to these products in the ultimate.

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