

we suggest to avoid the use of propofol for SE treatment in patients with mitochondrial encephalopathy. Midazolam is well tolerated and is a therapy of choice for SE in MELAS.

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### Post-anoxic status epilepticus: A review of our experience in the last five years

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**Background:** Status epilepticus (SE) after cardiac arrest (CA) is associated with high mortality despite an appropriate antiepileptic treatment. The aim of our study is to determine which factors could contribute to a better prognosis in this patients, taking into account the duration of the status, EEG pattern and drugs used.

**Methods:** We retrospectively analysed our patients who suffered SE following CA in the last five years (2013-2018). EEG background patterns of SE, duration of SE, presence and characteristics of clinical seizures and use of antiepileptic drugs (AD) were assessed. Outcome was evaluated using the Cerebral Performance Category (CPC).

**Results:** We collected 34 patients admitted to the ICU after CA who presented anoxic encephalopathy. 14 patients (41.17%) developed a myoclonic status after finishing therapeutic hypothermia and onset of awakening. All were treated with a combination of AD, including valproic acid, levetiracetam, anesthetics (midazolam and propofol), occasionally phenytoin, and in two cases, ketamine and lacosamide. Five patients presented a flat encephalographic pattern while six patients showed continuous generalized paroxysmal discharges. Two patients survived (CPC: 2 and 3, respectively). Median survival of the deceased patients was 14.4 days.

**Conclusions:** In post-anoxic encephalopathy, SE is a frequent complication and it normally correlates with poor outcome. A continuous EEG and multimodal prognostication approach to adapt pharmacologic treatment would be necessary in order to improve the prognosis.

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### Eucalyptus Oil Ingestion Induced Status Epilepticus: A Short Case Series

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**Introduction:** Eucalyptus oil is an essential oil derived from leaf of Eucalyptus tree and is widely used as an over the counter remedy for common ailments. Here we report a small case series of 3 adults with Eucalyptus oil induced status epilepticus.

### Case Presentations:

#### Case 1

24-year-old young man was admitted to the critical care intensive care unit of our hospital with status epilepticus of unknown cause. History was clarified from father who narrated the following incident. He (Father) had bought a bottle of eucalyptus oil at home few weeks back. As the bottle was leaking he transferred the contents from the eucalyptus bottle to another empty cough syrup bottle. His son who was apparently healthy came home in the afternoon and drank 5 ml of the liquid (Eucalyptus oil) from the cough syrup bottle as he was having some cough and cold from the morning. 5 min after drinking the syrup he had an episode of generalized tonic-clonic seizures and had multiple episodes after that. He was taken to a near by hospital for the initial treatment and was later transferred to our hospital in a critical state. In our critical care unit he was intubated and was treated for status epilepticus with lorazepam, phenytoin, levetiracetam and midazolam infusion. His CT Brain showed diffuse cerebral edema while EEG showed diffuse slowing in the delta range. He developed multiorgan dysfunction and died on the 5<sup>th</sup> day of admission.

#### Case 2

31-year-old man used to take few drops of eucalyptus oil mixed with water occasionally for abdominal pain for the past 3 years. He drank 2-3 tea spoon full (10-15 ml) of Eucalyptus oil for abdominal pain and had multiple episodes of generalized tonic clonic seizures, 20 minutes after the intake. He was taken to a near by hospital and was treated with intravenous antiepileptic drugs and was discharged after 5 days on Tab levetiracetam 500 mg bid. His hematological, biochemical and neurological investigations were unremarkable.

#### Case 3

38-year-old man was a case of post traumatic occipital lobe epilepsy and was well controlled on Tab phenytoin 300 mg per day. He had headache and cold for which he applied various balms and oils containing eucalyptus and camphor and had multiple episodes of visual aura in the form of flashes of light with altered sensorium on going for hours suggestive of a complex partial status. His MRI brain showed occipital gliosis and EEG showed slowing from the occipital regions. He was discharged with an advice to avoid these essential oils which provoke seizures.

**Discussion:** Essential oils like eucalyptus have epileptogenic potential which is rarely recognized by public and physicians. These essential oils are kept in the houses in open places within the reach of everyone including toddlers as they are generally perceived as safe. Here we have described three cases of Eucalyptus oil induced status epilepticus in three young adults. The young man who expired following status epilepticus and multiorgan dysfunction had consumed it accidentally while others took as remedy for abdominal pain and upper respiratory tract infection. The epileptogenic properties of plant derived essential oils are known for centuries but public and physicians are equally ignorant of these serious complications. The essential oils which are epileptogenic are eucalyptus, camphor, thuja, sage, spike lavender and turpentine. 1 The route of exposure, the type and amount taken all may be important in causing these complications. The essential oil of eucalyptus and camphor are the ones which are commonly used and abused. These contain an aromatic monoterpene called 1,8 Cineole, which is epileptogenic compound. 1,8 Cineole has a mechanism of action similar to known anti-convulsant pentylenetetrazole. 2 Although there have been no explicit studies outlining the mechanism by which 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. 3 In cases of so called de novo status epilepticus exposure to essentials oils need to be sought. Public and physicians should be made aware of the epileptogenic potential of these essential oils.

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