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Learning objectives

- ✓ Malignant Hyperthermia is a rare condition.
- ✓ Anesthesiologists must stay aware and prepared to treat.
- ✓ ECT itself is not a direct trigger for MH; succinylcholine is.
- ✓ Dantrolene must stay close.



Case Report:

- Female, 36 years old, presented to the emergency department with a catatonic state associated with bipolar mixed disorder. Pregnant,19 weeks of gestational age. Psychiatrists decided on three sessions of electroconvulsive therapy (ECT), and the obstetric team ensured fetal vitality.
- In the surgical ward, the patient had stable vital signs associated with a catatonic condition. The anesthetic team performed a rapid sequence induction with fentanyl, etomidate, and succinylcholine.
- During orotracheal intubation (TI), masseter rigidity and a delay in vocal cord relaxation were noted. Then, ECT was performed (without the administration of IV caffeine), and the patient evolved into bradycardia, tachycardia, and sustained convulsions. Midazolam ceased it.
- While in mechanical ventilation and waiting for spontaneous recovery, ETCO2 started to increase, reaching over 90, 120 mmHg, despite hyperventilation. The esophageal temperature was 37.1 °C, with a tendency to increase. MH was suspected.
- Dantrolene was administered as a bolus of 2.5mg/kg. ETCO2 turned into 33. The patient was maintained in a stable condition in the ICU with a 24-hour continuous infusion of dantrolene.
- Extubated in the ICU 24 h after the hypermetabolic event.
- Without signs of fetal distress.

- One week later, the psychiatric team decided to add three new sessions of ECT since the patient remained catatonic despite the high doses of lamotrigine and aripiprazole.
- As she had periods of pulmonary aspiration of gastric contents, she was tracheostomized, and the remaining ECT sessions were performed with fentanyl, etomidate, and rocuronium. Without any complications. (The surgical room was fully prepared to receive a patient susceptible to MH).
- Muscle biopsy (one month after the crisis) was inconclusive, but with a full suspicion of MH.
- The patient remained in the ICU until the C-section at 36 weeks of GA.
- The anesthesia for the C-section was uneventful. With the surgical obstetrical room prepared, Total intravenous anesthesia was performed (sufentanyl, propofol, and rocuronium). Maintenance with TCI (propofol and remifentanyl) and TAP block, as well as SC morphine, was done for postoperative analgesia.
- A new fragment of muscle was collected for biopsy, and a fragment of the placenta was referred to the pathologist for a morphological study.
- The newborn had an Apgar score of 3 and 8. Also, 2.400 kg of weight.
- During follow-up, the muscle biopsy was positive for MH. (4 months after the crisis).
- The exoma (oral swab) was collected (48 hours after C-section) for genetic investigation; mitochondrial DNA. One month later, the result was negative for susceptibility to MH (no RYR1 mutations were found).
- The patient is still in the hospital for rehabilitation and decannulation ( she has generalized sarcopenia).

Conclusion:

- ✓ Despite being a rare condition, prompt recognition and treatment of MH are critical. In our report, the suspicion was the recognition of elevated levels of ETCO2, despite hyperventilation.
- ✓ The mainstay of therapy is immediate administration of intravenous dantrolene, discontinuation of triggering agents, active cooling, correction of metabolic derangements, and supportive care to prevent complications such as renal failure and coagulopathy.
- ✓ The risk of MH emphasizes the importance of close perioperative monitoring for signs of hypermetabolic crisis in all patients receiving succinylcholine, including those undergoing ECT, and the need for rapid access to dantrolene in any setting where succinylcholine is administered.



References:

- Caution for Psychiatrists: Malignant Hyperthermia Risks With theAnesthetic Agent Succinylcholine (Suxamethonium) DuringElectroconvulsive Therapy. Nakano M, Funayama M, Takata T, et al.BMC Psychiatry. 2024;24(1):411. doi:10.1186/s12888-024-05846-5.2.
- Malignant Hyperthermia. Pinyavat T, Riazi S, Deng J, et al.Critical Care Medicine. 2024;52(12):1934-1940.doi:10.1097/CCM.0000000000006401.