

Critical Incident – Malignant Hyperthermia

Clinical setting

15 minutes ago you anaesthetised a 19 year old man for correction of a recurrently dislocating patella. He is ASA 1, no previous anaesthetics. Anaesthesia was induced with propofol and fentanyl, a LMA inserted and he is breathing sevoflurane in oxygen enriched air. Over the past 10 minutes he has become increasingly tachycardic.

Clinical course

Initially: A: clear, B: 34/min, SpO₂ 94%, EtCO₂ 7.8kPa, C: P 144/min, BP 142/56, D: anaesthetised E: flushed

- No change in response to analgesia, increasing FiO₂, controlled ventilation
- Recognise possibility of malignant hyperthermia, temp 40.4°C
- Discontinues anaesthesia, institutes dantrolene therapy and cooling
- Refer to ITU

Interventions – key points in bold:

Initial approach

- **ABCDE assessment**
- Increases FiO₂, IV analgesia, increases sevoflurane, manual ventilation
- **Recognise potential for malignant hyperthermia**
- **Requests temperature probe**
- **Stops sevoflurane, start hyperventilation with 100% oxygen**
- **Requests vapour free anaesthetic machine**
- **Calls for help**, at least 3 people required
- Requests termination of surgery as soon as possible
- **Sends for dantrolene, designate person to start dissolving powder (in sterile water)**

- **Gives initial dose 2.5mg/kg as soon as available**
- **Start active cooling**
 - Completely expose patient
 - Cold saline IV
 - Ice packs over axillary and femoral vessels
 - Wet sponging and fans to promote evaporation
 - Consider gastric or peritoneal lavage
- **Send arterial blood sample** (insert arterial line)
- **Treat acidosis with 8.4% sodium bicarbonate 2-4 mmol/kg**
- Treat hyperkalaemia – glucose/insulin, CaCl
- **Urinary catheter**, send samples for myoglobinuria
- Forced alkaline diuresis (aim for urine output >3 ml.kg⁻¹.h⁻¹, urine pH >7.0)

- **Send bloods for:**
 - **electrolytes, LFTs, glucose**
 - **PT, APTT, FDPs, platelets**
- **Consider further doses of dantrolene 1mg/kg every 5 min, max dose 10mg/kg**

- Arrange bed in ITU
- Continue sedation with propofol infusion

Discussion:

Location of dantrolene in theatre/critical care

Treatment of DIC – FFP, cryo, platelets

Treatment of arrhythmias – magnesium, amiodarone, procainamide. Avoid Ca²⁺ channel blockers – interact with dantrolene.

Referral/counselling

Equipment:

- **Mannequin**
- **LMA, breathing circuit and clean vapour free circuit**
- **Monitor – ECG, SpO2, BP**
- **Cannulae**
- **IV fluids**
- **Blood bottles**
- **Dantrolene (improvise)**
- **AAGBI MH crisis safety guideline 2011 on wall**