mhanz
Malignant Hyperthermia
Australia & New Zealand

Management of
Malignant Hyperthermia

You've only got a few minutes ...

Know who is susceptible:

Malignant Hyperthermia may occur in any patient, including patients who have previously had uneventful general anaesthesia.

MH is more likely with:

- Diagnosed malignant hyperthermia susceptibility after halothane/caffeine contracture test on biopsied muscle
- Malignant Hyperthermia susceptible relatives
- Significantly & consistently raised resting serum CK
- Several very rare muscle disorders

Know the signs & symptoms:

NOT ALL NEED TO BE PRESENT TO INITIATE TREATMENT

EARLY:

- Prolonged masseter muscle spasm after suxamethonium
- Inappropriately raised end tidal carbon dioxide during controlled ventilation or tachypnoea during spontaneous respiration
- Inappropriate tachycardia
- Cardiac arrhythmias; particularly ventricular ectopic beats

DEVELOPING:

- Rapid rise in temperature (0.5°C per 15 minutes)
- Progressive metabolic and respiratory acidosis (ABG)
- Hyperkalaemia
- Profuse sweating
- Cardiovascular Instability
- Decreased SpO2 or mottling of skin
- Generalised muscular rigidity

LATE:

- 'Cola' coloured urine - due to myoglobinuria
- Generalised muscle ache
- Grossly raised serum CK
- Coagulopathy
- Cardiac arrest

Differential diagnoses:

- Inadequate anaesthesia or machine malfunction
- Sepsis or infection
- "Thyroid storm"
- Serotonin syndrome
- Ecstasy or other recreational drugs
- Phaeochromocytoma
- Neuroleptic Malignant Syndrome
- Intracerebral infection or haemorrhage
- Inadvertent overheating

Management:

IMMEDIATE MANAGEMENT WITH DANTROLENE IS ESSENTIAL

Stop the TRIGGER

- Declare an emergency and where possible stop the surgery
- Turn off volatile agent and HYPERVENTILATE with very high flows (15L/min) of 100% O2 (Do not waste time changing the circuit or the anaesthetic machine)
- Commence non triggering anaesthesia (TIVA)

Give Dantrolene as a priority

- Dantrolene 2.5 mg/kg IV initial push and repeat as necessary
- Dosing is the same per kg for paediatric patients
- Mobilise other sources of dantrolene (you may need at least 36 ampoules)
- Mix each ampoule with 60 mls sterile water

SIMULTANEOUSLY TREAT THE LIFE THREATENING EFFECTS:

- Treat the hyperkalaemia
  - Hyperventilate and treat the acidosis
  - CaCI2 10% (0.15 ml/kg = 10mls = 7 mmol in adults)
  - Insulin 0.15 u/kg + dextrose 50% 0.5 ml/kg (10 u + 50 ml in adults)
- Cool the patient if T > 38.5°C
  - IV normal saline at 4°C: surface cooling with ice
  - Consider peritoneal lavage with normal saline at 4°C
- Treat the acidosis
  - Hyperventilate to at least normocapnia
  - Consider sodium bicarbonate 0.5 mmol/kg IV as necessary to maintain pH >7.2
- Treat arrhythmias (if resistant consider hyperkalaemia as cause)
  - Lignocaine 1-2 mg/kg
  - Amiodarone 2-3 mg/kg over 15 minutes

In Addition To Routine Anaesthetic Monitoring

- Monitor core temperature
- Insert an arterial line
- Send urgent bloods
  - ABG, U+E, FBC, CK, & COAG (urine myoglobin)
  - Repeat frequently to monitor success of therapy
- insert urinary catheter
  - Maintain urine output above 2 ml/kg/hr
- Insert central venous line
  - DO NOT delay Dantrolene therapy with attempted CVL placement

When the patient is stabilised:

ALL PATIENTS WITH KNOWN OR SUSPECTED MH REACTIONS SHOULD BE ADMITTED TO ICU

- Monitor the patient for at least 24 hrs post
  - Rrecauctriroenn ce may occur...LARGE amounts of Dantrolene may be needed in the first 24 hrs

Give early consideration to:

- Mobilising additional sources of dantrolene
- Transferring patients with fulminant reactions to major centres after stabilisation

Notify your local MH Investigation Unit of ANY clinically suspicious reactions so that patients & family members can be investigated in the future

NEW ZEALAND:
Department of Anaesthesia. Palmerston North Hospital. 64 6 356 9169

NEW SOUTH WALES:
Department of Anaesthesia. Westmead Children's Hospital. 61 2 9845 0000

VICTORIA:
Department of Anaesthesia. Royal Melbourne Hospital. 61 3 9342 7000

WESTERN AUSTRALIA:
Department of Anaesthesia. Royal Perth Hospital. 61 8 9224 1038

Further resources and referral instructions are available at **www.malignanthyperthermia.org.au**

This poster is designed as an initial guide and practical memory aid for the treatment of an MH episode. It is not an exhaustive prescription for all MH crises It represents the views of the MHANZ and has been endorsed by the Australian and New Zealand College of Anaesthetists as part of the MH resource kit 2018