Audit of practice of preparing anaesthesia machine for Malignant hyperthermia susceptible patients among Anaesthesia doctors and ODPs

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Background

Malignant hyperthermia (MH) is a rare pharmacogenetic disorder triggered by potent volatile anaesthetic gases and succinylcholine. This hypermetabolic state produces a mixed metabolic and respiratory acidosis associated with hyperkalemia, rhabdomyolysis and hyperthermia. Preoperative screening for MH susceptible patients would require a massive undertaking to determine who is at risk for an adverse event from exposure to potent inhaled anaesthetics. Morbidity and mortality can be high if not diagnosed early and treated appropriately with Dantrolene sodium.

The current understanding of the maximum safe level of exposure to a volatile anaesthetic gas for a MH-susceptible patient is ≤ 5 ppm. Based on the findings of the research done on different anaesthesia systems, a recommendation has been made by the manufacturer suggesting certain steps to follow for preparing an anaesthesia system for a MH-susceptible patient.

Standards and Objectives

We have MH treatment guidelines already laminated in the department.

No guidelines were available in our department to prepare the anesthetic machine for MH susceptible patients.

Before preparing a guideline, we planned for an audit. It is a baseline audit – No local standards were available.

A compliance level of 90-100% was expected.

Methodology

This was a prospective audit. This was done in Southport and Ormskirk district general hospital, United Kingdom. We handed over the questionnaire to anaesthesia doctors and ODPs and requested them to fill.

We had 43 filled questionnaires by the end of audit. It was done between July–August 2018.

Results

What do you think the maximum safe level of exposure to a volatile agent in patient who is MH susceptible?

If you have an MH susceptible patient on the list, do you use the anaesthesia machine which was not used for 2 hours?

Do you need to use a new breathing circuit for MH susceptible patient?

Do you need to use a new breathing bag for MH susceptible patient?

Do you need to flush the system before using anaesthesia machine in these patients?

How much tidal volume will you use to flush with?

Will you use PEEP while flushing with mechanical ventilation?

How much flows will you use for flushing?

What is the minimum washout times in minutes?

Answers:

Minimum was 5 minutes

Maximum was 720 minutes

Mostly said between 30-120 minutes

How much flow will you use during the case?

Discussion

In only 50 % of questions, more than 90 % responded correctly so assurance level of the audit was 50 %. Since MH is a rare condition, it is not possible to remember every detail to prepare the anaesthesia machine for MH susceptible patient.

We didn't have any Checklist available at our department to help the anaesthetist and ODPs with this. So, we recommended to keep this checklist in MH trolley. We also aim to develop a pathway which will guide about how to prepare for an MH susceptible patient who is booked for an elective operation.

As per recommendation, a checklist was added to our departmental MH trolley and also a MH pathway was developed.

References

<https://www3.gehealthcare.com/media/downloads/us/product/product-categories/anesthesia-delivery/gehc-technical-report-anesthesia-machine-malignant-hyperthermia.pdf>