Malignant Hyperthermia

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Malignant Hyperthermia
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References

Significance of Pathophysiology
Malignant hyperthermia is a rare, autosomal dominant disorder and medical emergency that requires immediate recognition and treatment in order to increase patient’s chances of survival. It has varying penetrance and is typically triggered by volatile anesthetics and/or depolarizing muscle relaxant (succinylcholine). CRNAs must perform a thorough preoperative assessment to determine any indicators of patient’s MH susceptibility. Operating room personnel must be familiar with signs and symptoms of MH, especially early signs of MH in order to implement timely MH protocol treatment. CRNAs, operating room nurses and ICU nurses must be educated on MH treatment and management for best possible patient outcome.

Implications for Nursing Care
At first suspicion of MH, discontinuine inhalation agent, call MH hotline 1-800-444-9777.


Clinical significance of malignant hyperthermia
Malignant hyperthermia is a rare, autosomal dominant disorder and medical emergency that requires immediate recognition and treatment in order to increase patient’s chances of survival. It has varying penetrance and is typically triggered by volatile anesthetics and/or depolarizing muscle relaxant (succinylcholine). CRNAs must perform a thorough preoperative assessment to determine any indicators of patient’s MH susceptibility. Operating room personnel must be familiar with signs and symptoms of MH, especially early signs of MH in order to implement timely MH protocol treatment. CRNAs, operating room nurses and ICU nurses must be educated on MH treatment and management for best possible patient outcome.

Incidence of MH varies between 1/5,000 to 1/20,000 in high risk patients and only 0.5 cases per 100,000 in young people with a median age of 18 years. Until exposure to volatile anesthetics or succinylcholine is associated with a risk of MH. However, MH susceptibility is not limited to the MH genetic defect, but also includes other factors such as the patient’s intrinsic physiological characteristics, the triggering agent, and the genetic makeup of the patient. The MH genotype is determined by the specific RYR1 gene mutation, which is a factor that can influence the severity of the MH. Therefore, MH is not only a genetic disorder, but also a complex interaction between the patient’s genetic makeup and environmental factors.

The RYR1 is a key protein that regulates calcium release in muscle tissue. When the RYR1 gene is mutated, the channel becomes leaky, allowing calcium to flow into the muscle fibers, leading to hyperthermia, rhabdomyolysis, and other symptoms. The MH genotype is determined by the specific RYR1 gene mutation, which is a factor that can influence the severity of the MH. Therefore, MH is not only a genetic disorder, but also a complex interaction between the patient’s genetic makeup and environmental factors.

The MHCR is a clinical tool that helps identify patients at risk for MH. It is based on a combination of genetic and clinical factors. Patients with a high MHCR score are more likely to develop MH. However, the MHCR score alone is not sufficient to predict MH. Other factors such as the patient’s medical history, the triggering agent, and the anesthesiologist’s experience must also be considered.

The MHCR score is calculated using a formula that takes into account the patient’s age, sex, family history, and medical history. The score ranges from 0 to 5, with a score of 4 or higher indicating a high risk of MH. However, the MHCR score alone is not sufficient to predict MH. Other factors such as the patient’s medical history, the triggering agent, and the anesthesiologist’s experience must also be considered.

In conclusion, Malignant hyperthermia is a rare but potentially fatal skeletal muscle disorder that requires prompt intervention to decrease mortality rate. In the initial years of MH discovery, mortality rate due to MH was 60%. However, in recent years, this number has changed to approximately 5%, and is contributed to increased awareness and education among healthcare providers, early recognition and accurate diagnosis, initiation of specific treatment, and patient’s genetic makeup.

In summary, Malignant hyperthermia is a rare, autosomal dominant disorder and medical emergency that requires immediate recognition and treatment to increase patient’s chances of survival. It is typically triggered by volatile anesthetics and/or depolarizing muscle relaxant (succinylcholine). CRNAs must perform a thorough preoperative assessment to determine any indicators of patient’s MH susceptibility. Operating room personnel must be familiar with signs and symptoms of MH, especially early signs of MH in order to implement timely MH protocol treatment. CRNAs, operating room nurses and ICU nurses must be educated on MH treatment and management for best possible patient outcome.

References

Conclusion
Malignant hyperthermia is a rare, autosomal dominant disorder and medical emergency that requires immediate recognition and treatment in order to increase patient’s chances of survival. It has varying penetrance and is typically triggered by volatile anesthetics and/or depolarizing muscle relaxant (succinylcholine). CRNAs must perform a thorough preoperative assessment to determine any indicators of patient’s MH susceptibility. Operating room personnel must be familiar with signs and symptoms of MH, especially early signs of MH in order to implement timely MH protocol treatment. CRNAs, operating room nurses and ICU nurses must be educated on MH treatment and management for best possible patient outcome.