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Malignant Hyperthermia: A Clinical Crisis
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Introduction
Malignant hyperthermia, though uncommon, is a serious and life threatening condition. Malignant hyperthermia is an autosomal dominant disorder that affects skeletal muscle. It can be caused by various genetic and anesthetic agents like succinylcholine and several inhaled anesthetics. Malignant hyperthermia is a relevant topic to many registered nurse anesthetists and other nurses due to the potentially fatal result if not recognized and treated promptly. In understanding the pathophysiology, risk factors, signs and symptoms, epidemiology, and current treatments the health care provider can help to prevent complications due to this disorder (Nagelhout, 2014).

Pathophysiological Process
Malignant hyperthermia is a rare disorder and can often have devastating effects. It is often a difficult disease to diagnose due to other diseases with similar symptoms and the fact that malignant hyperthermia can happen at different times during the procedure. Understanding pathophysiology of this disorder can lead to better outcomes and prevent catastrophic events. With early recognition, diagnosis, and treatment with dantrolene sodium the mortality rate of malignant hyperthermia decreased from 80% in the 1970s to less than 5% by 2007 (Donnelly, 2013).

Significance of Pathophysiology
The understanding of the pathophysiology and signs and symptoms of malignant hyperthermia directly affects nursing care. It is important to understand what population makes up high risk patients. A practitioner, with a good preoperative history, can assist in a patient is at high risk. Any person with a family history of anesthetic reaction or malignant hyperthermia should be red flagged and suspected of possibly getting malignant hyperthermia with anesthesia. Also, the practitioner knows that the highest rate of malignant hyperthermia occurs amongst younger people with an average age of 18. A practitioner should also know to correctly diagnose and know the steps to handle a malignant hyperthermia crisis. The Malignant Hyperthermia Association of the United States recommends that information on how to handle a crisis be posted in all surgical rooms. The steps include to discontinue anesthetics if possible, hyperventilate gas (100% FiO2), Cool Patient if core temperature>39C, Give Dantrolene 2.5mg/kg (repeat as needed), Stop Surgery if possible and discontinue inhaled anesthetics and Give Dantrolene and give 100% FiO2. Dantrolene is an important medication in malignant hyperthermia and has been directly related to the drop in mortality in the last 30 years. Dantrolene relaxes muscles by decreasing calcium produced by sarcoplasmic reticulum which directly reverses the pathophysiological process of malignant hyperthermia (Donnelly, 1994).

Implications on Nursing Care
Retrieved on July 20, 2015 from www.downstate.edu

Environmental Agent (Anesthetic Agent)

Increase Release of Calcium into Muscle

Increase Muscle Metabolism

Increase O2 Consumption

Mycocyte Failure/Death

Increase Perfusion

Myoglobin, Creatine Kinase

Arteriosclerosis, Kidney Failure

Acidosis, Gastrointestinal

Signs and Symptoms
Malignant hyperthermia has a wide range of manifestations in a patient. It can be very acute with sudden and apparent muscle rigidity post anesthetic or if the process can occur gradually and not those signs or symptoms until several hours post procedure. Besides the variety of timing, malignant hyperthermia is also varies in severity from mild complications to full systemic complications that can result in death. Though malignant hyperthermia is a disorder that affects skeletal muscle. It is defined as an inherited disorder that affects skeletal muscle. It is due to the potentially fatal result if not recognized and treated promptly. In understanding the pathophysiology, risk factors, signs and symptoms, epidemiology, and current treatments the health care provider can help to prevent complications due to this disorder (Nagelhout, 2014).

Additional Sources

Conclusion
Malignant hyperthermia is a genetically acquired disease that can cause death if not diagnosed and treated early enough. It’s detrimental effects depend greatly on the practitioners knowledge and understanding of the pathophysiology and the signs and symptoms that manifest with malignant hyperthermia. Once diagnosis is determined treatment should be given immediately to best prevent ill outcomes brought on by malignant hyperthermia.