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Multiple Sclerosis and the Implications of Anesthesia

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Introduction

Multiple Sclerosis (MS) is an autoimmune process characterized by inflammation and demyelination of the brain and spinal cord (Schneider, 2005). According to Maclean (2010), MS is one of the most common debilitating neurological disorders in young adults. My intent of this research project is to explain the pathophysiological process and become familiar with the implications of anesthesia related to MS. This research will enable me to provide safe, individualized anesthetic, taking all essential precautions when caring for a patient with multiple sclerosis.

Pathophysiological Process

Underlying pathophysiology:

The etiology of MS is unclear, however there is speculation that the activation of auto-reactive T lymphocytes occurs secondary to the exposure to environmental factors, an infectious process or viruses (Ward-Abel, V., & Warner, R. 2014). After T lymphocytes are activated, they infiltrate the central nervous system (CNS), by breaking through the blood brain barrier. T lymphocytes also activate an inflammatory cascade, which encompasses CD4+ and CD8+ T cells, B cells, interleukin 1-6, 1-1, and tumor necrosis factor leading to the destruction of oligodendrocytes and myelin (Gupta et al, 2014). Destruction of oligodendrocytes, cells that produce myelin, inhibits the body's ability to remyelinate neurons over time, leading to progressive demyelination of MS lesions (Schneider, 2005). Demyelination impedes conduction and transmission of nerve impulses, thus creating cognitive and motor complications throughout the body.

Implications for Anesthesia

According to Schneider (2005), the stress of surgery and use of anesthetic agents will lead to an exacerbation of MS symptoms, yet the complications of surgery, such as infection and hypothermia have the potential to trigger a relapse. The anesthesiologist must consider the individual's severity of debilitation when deciding whether or not to administer an anesthetic. If the patient has respiratory weakness secondary to MS then the NA would likely elect to place the patient under general anesthesia, to mechanically ventilate the patient (Schneider, 2005). Depending on the severity of weakness the patient may be difficult to intubate, or to establish an adequate airway for positive pressure ventilation. Therefore, general anesthesia is contraindicated for any patient with MS. It is paramount that anesthesiologists conduct an extensive review of one's surgical, medical and family history in order to create a safe plan for anesthesia. In combination with a detailed history, the nurse anesthetist (NA) must also conduct a thorough head to toe assessment. The physical assessment provides insight regarding physical frailty, such as respiratory, cardiac, nervous or bowel complications that the individual may experience, which further guides the nurse anesthetist's plan for anesthesia. Patient education is also vital to the prevention of MS relapse during the pre and postoperative phases.

Types of Multiple Sclerosis

Types of MS

Primary progressive

Relapsing-remitting

Secondary progressive

Common Presentation

Relapses appear and get worse (progression) from the start. Remissions are rare. For those patients whose MS relapse as well as progress from the start, the term ‘progressive’ relapsing MS is used.

Relapses appear then resolve, partially or fully (remission). Relapses last for at least 24 hours, but commonly last for weeks or months. Remissions can last at least 24 hours and not caused by infection or any other known cause (McDonald et al, 2001).

In conclusion, Multiple Sclerosis is an autoimmune process leading to the demyelination of axons, which slows the conduction and transmission of nerve impulses throughout the body. A wide array of neuromuscular complications can occur secondary to neuronal damage. Nurse anesthetists are challenged with the task of formulating an anesthetic plan for each MS patient and he or she encounters individuality, depending on the severity of one's complications and degree of disease progression.

References


Additional Sources


N/A

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Conclusion

It is our duty as healthcare providers to educate our patients so they have the information necessary to make informed decisions, preventing those with MS from experiencing a worse postoperative complication and decreasing the risk of exacerbation of symptoms related to MS.