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Multiple Sclerosis

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Multiple Sclerosis

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Introduction

Multiple sclerosis (MS) is an advanced pathophysiological disease that is relevant to advanced practice nursing. It is the "most common immune-mediated inflammatory demyelinating disease of the central nervous system" (Olek & Howard, 2019). The exact cause of MS is still unknown; however, it is characterized by exacerbations of neurological dysfunction due to inflammatory demyelination (Huang, Chen, & Zhang, 2017).

Consequently, the treatment of MS requires a multi-disciplinary approach, with nurses at the heart of the team. Hence, an advanced practice nurse will need to be able to recognize the signs and symptoms of MS for a proper diagnosis and must be familiar with the current trends in patient management and treatments of the disease. This help to support and advocate for best available intervention strategies acceptable to the patient and relevant to decrease chronic pathology.

Reason for Study

- MS is the leading cause of neurologic disability in young to middle-aged adults. This causes an important socio-economic impact (D'haeseleer, et al., 2015) which nurses can help address with proper referral and treatment.
- Due to the unpredictable and highly variable course MS takes it is important for the multi-disciplinary team to be well informed of the pathophysiology of MS (Feys et al., 2016).

Presentation of Case

A 69-year-old female diagnosed with MS 27 year ago. Symptoms began as weakness in the left leg that would come and go. The weakness slowly spread to the right side of the body. The patient went to the doctor when the right side went completely weak. At the beginning of the disease process the patient was not on any medications. When there was an exacerbation, the patient would be off work for two or three weeks. Resting aided in recovery. No medications were taken at this time.

The first MS drug tried was Betaseron, for approximately 10 years. During this time there would be exacerbations approximately every two years. Rest and IV steroids would aid in recovery.

The patient was taken off of Betaseron with a new neurologist due to the side effect of depression, which the patient was experiencing. The medication Copaxone was taken, but the results were not desired, so it was discontinued. For several years the patient was not on any medication for MS. Two years ago, Ocrevus was started. The patient is very pleased with the results. There are no new lesions on the current MRI.

The main symptom the patient has is weakness in legs which has caused progressive loss of function leading to using a progression from a cane, to a walker, then to a wheelchair for mobility. Fatigue, incontinence, depression, and feeling useless are other symptoms the patient reports.

Aggravating factors are heat, humidity, stress, and negative people. Relieving factors are working on crafts, being outside when able, bible study, reading, and watching tv. There is no family history of MS.
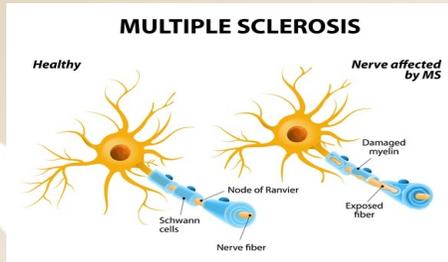
MULTIPLE SCLEROSIS

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Signs & Symptoms

The signs and symptoms of MS vary depending on the affected part of the Central Nervous System (CNS) (Arneth, 2019).
- White matter plaque formation (Arneth, 2019)
- Axonal injury (Arneth, 2019)
- Demyelination (Arneth, 2019)
- Sensory loss (Huang et al., 2017)
- Visual disturbances (Huang et al., 2017)
- Double vision (Huang et al., 2017)
- Muscle weakness (Huang et al., 2017)
- Ataxia (Huang et al., 2017)
- Impaired balance (Huang et al., 2017)
- Fatigue (Žiaková, Čáp, Miertová, & Gurková, 2019)
- Exhaustion (Žiaková et al., 2019)
- Bowel and bladder dysfunction (Arneth, 2019)
- Depression (Kamm, Uitdehagg, & Polman, 2014)
- Sleep disorders (Kamm, Uitdehagg, & Polman, 2014)
- Spasticity (Kamm et al., 2014)
- Tremor (Kamm et al., 2014)

Underlying Pathophysiology

The exact cause of MS is unknown. Many theories exist to answer this question, several of which are listed below.
- One widely accepted theory for the pathogenesis of MS is that it begins as an inflammatory immune-medicated disorder (Olek & Mowry, 2019).
- B cells through several mechanisms including the establishment of ectopic lymphoid follicles within the CNS (Huang et al., 2017).
- B cells are also thought to affect MS development by targeting autoantigens (Arneth, 2019).
- Cytokine and antibody production is another theory (Huang et al., 2017).
- Tumor necrosis factor-alpha inhibitors could have a role in the cause of MS (Olek & Mowry, 2019).
- One theory suggests that the Epstein-Barr Virus (EBV) could cause MS. The upregulation of antigen specific cytotoxic T cells stay in the body for several years after the initial infection. Autoimmunity results when the cytotoxic T cells target self-peptides in the CNS (Spagnuolo, Piavis, & Williams, 2017).
- While it is not understood what exact role heredity plays in developing MS, there are some genes that lead to an increased risk. Specific genes related to inflammation have been found with an increased risk of MS. People who have dysregulation of T-cell differentiation have a higher prevalence of MS (Spagnuolo et al., 2017).
- Dendritic cells (DC) are part of the pathogenesis of MS. Different types are found in white matter and cerebrospinal fluid of people who have MS (Spagnuolo et al., 2017).

Significance of Pathophysiology

In MS plaques form in the CNS and combined with inflammation, demyelination, axonal injury and axonal loss are the defining processes of the disease (Huang et al., 2017). The plaques are expressed in all of the forms of MS. Over time the plaques disappear and return at different intervals (Huang et, al. 2017). The location of the plaques dictates the symptoms expressed and amount of disability the patient experiences.

The disease is progressive in nature and has different, defined types. A person is first diagnosed when a sudden onset of a neurological symptom compels a visit to the primary health care provider (Huang et al., 2017). The relapsing remitting type of MS is exhibited by periods when the person is symptomatic followed by times of no symptoms. Recovery from these episodes can be complete or partial (Huang et al., 2017). This type of MS often turns into a type of the disease called secondary progressive. This is characterized by continuous irreversible neurological impairment between relapses (Huang et al., 2017). In primary progressive MS the patient has a gradually progressive course from the time of diagnosis (Huang et al. 2017). There are no periods of remission. Progressive-relapsing MS is characterized by a pattern of relapses while neurologic functions are worsening from the onset of symptoms (Sevim, 2016).

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Implications for Nursing Care

The unknown exact cause of MS, the wide variety in symptoms, and the unpredictability of the disease course has significant implications for the patient and the nurse. Feys et al. (2016) suggests a multi-disciplinary approach to adequately meet all of the patients complex and often changing needs. This team can include a neurologist, nurse, primary care provider, other specialists, and professionals outside of the health care sector (Feys et al., 2016).

Many new management options have been found in the past 20 years (D'haeseleer, 2015). Nurses need to keep up with changes in treatments to help educate patients not only about current options, but side effects as well. The focus of the care needs to be the improvement of quality of life and the patient's ability to work (Kamm et al., 2014). Suggestions for nurses can include linking the patient with accessibility resources or occupational therapy. People who have MS noted the feeling of invisibility (Žiaková, Čáp, Miertová, & Gurková, 2019). The nurse needs to keep this in mind and address questions to the patient, not a care giver. The patient also might have cognitive or speech delays and would need more time to answer questions. The patients care giver is also affected, indirectly and must be considered by the nurse as well (Feys et al., 2016).
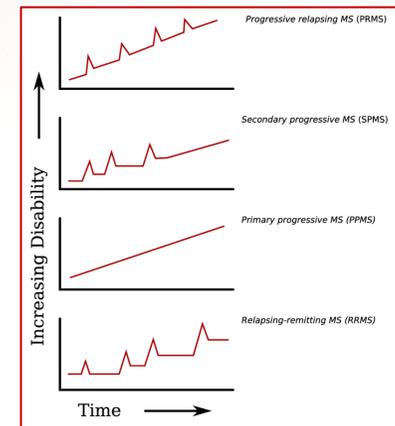
Visual model of the different types of MS. Source: http://commons.wikimedia.org/

Conclusions

Around the globe around 2.3 million people are diagnosed with MS (Arneth, 2019). The complex pathophysiology and insidious nature of the progression of the disease makes care complicated. While all patients show destruction of the myelin on the axons, symptoms vary widely depending on the location of the plaques. The ability to interpret the exacerbation signs and symptoms of MS is an important competency to possess. Nurses work as part of a multi-disciplinary team to provide a wide range of treatment options. Excellent nursing care focuses on the patient's quality of life.

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