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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 nurses. It is one of the most common immune-mediated inflammatory demyelinating diseases of the central nervous system (D‘haeseleer et al., 2016). The exact cause of MS is still unknown; however, it can be characterized by exacerbations of neurological dysfunction due to inflammation and 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 to be familiar with the current trends in patient management and rehabilitation of the disease. This help to support and advocate for adequate interventional strategies (Olek & Mowry, 2019).

**Reason for Study**

- MS is the leading cause of neurological disability in young and middle-aged adults. This invites an important socio-economic burden (D’haeseleer et al., 2015) which nurses can help address with referrals 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 (Feyz et al., 2016).

**Presentation of Case**

A 69-year-old female diagnosed with MS 27 years ago. Symptoms began with weakness in the left leg that would go 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 2 years. During this time there would be exacerbations approximately every two years. Real and fictitious tiredness would aid in recovery.

The patient was taken to BETaseron with a new neurologist with the side effect of depression, which the patient was experiencing. This was because of the new medication.

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 being a nonambulatory person. To walk, then to a wheelchair for mobility. Fatigue, incontinence, depression, and feeling of invisibility are the symptoms that are present.

People who have dysregulation of T-cell differentiation have a higher prevalence of MS (Spagnuolo et al., 2017).

**MULTIPLE SCLEOROSIS**

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**Signs & Symptoms**

The signs and symptoms of MS vary depending on the affected part of the Central Nervous System (CMS) (Arneth, 2019).

- **Ataxia** (Arneth, 2019)
- **Depression** (Arneth, 2019)
- **Sensory loss** (Huang et al., 2017)
- **Visual disturbances** (Huang et al., 2017)
- **Motor weakness** (Huang et al., 2017)
- **Impaired balance** (Huang et al., 2017)
- **Fatigue** (Zukowska, Cappelleri, & Polman, 2019)
- **Eloquence** (Zukowska et al., 2019)
- **Bowel and bladder dysfunction** (Arneth, 2019)
- **Depression** (Kamen, Utidzhan, & Polman, 2014)
- **Sleep disorders** (Kamen, Utidzhan, & Polman, 2014)
- **Spasticity** (Kamen et al., 2014)
- **Tremor** (Kamen 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-mediated disorder (D’haeseleer & Meyrowitz, 2019).
- It cells through several mechanisms including the establishment of ectopic lymphoid follicles within the CMS (Huang et al., 2017). It is also a theory that affects MS development by targeting a specific CNS antigen (Arkadiusz, 2016).
- Cytokine and antibody production are another theory (Huang et al., 2017).
- Tumor factor proteins are known to have a role in the cause of MS (Huang & Meyrowitz, 2019).
- One theory suggests that the Epstein-Barr Virus (EBV) could cause MS. The superinfection 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-epitopes in the CNS (Spagnuolo, Puce, & 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 in an increased risk of MS. People who have dysregulation of T-cell differentiation have a higher frequency of MS (Spagnuolo et al., 2017).

**Conclusions**

Around the globe around 2.3 million people are diagnosed with MS (Arneth, 2019). The complex pathophysiology along with the progression of the disease makes care complicated. While all patients show distress of the symptoms on the axis, 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.

**References**

Feyz, N., Smith, D., & Green, J. (2015). A multidisciplinary 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 (Feyz et al., 2016).

Many new management options have now been found in the past 20 years (D’haeseleer, 2015). Nurses need to keep up with changes in treatments to help educate patients. But only by keeping current, but side efforts as well. The focus of the care needs to be the improvement of quality of life and the patient’s ability to work (Kamen 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 (Zukowska, Cappelleri, & Gurkova, 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 patient care giver is also affected, indirectly and must be considered by the nurse (Feyz et al., 2016).

**Implications for Nursing Care**

The unknown exact cause of MS, the wide variety in symptoms, and the unpredictable nature of the disease make nursing care challenging for the patient and the nurse. Feyz et al. (2015) suggests a multidisciplinary 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 (Feyz et al., 2016).

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