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Multiple Sclerosis & Research

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Multiple Sclerosis and Research

Multiple Sclerosis (MS) is an inflammatory demyelinating disease of the Central Nervous System (CNS). Subjects 20-40 years old are affected in a relapsing-remitting, secondary progressive or primary progressive pattern. Although the clinical course of the disease is variable, it usually leads to progressive deterioration and severe disability. Both genetic and environmental factors have been implicated in the pathogenesis of MS. The precise cause remains largely unknown, but there is evidence of a myelin-antigen-specific, Th1-mediated immune process resulting in macrophage-mediated demyelination, axonal loss and gliosis.

Multiple sclerosis has no cure at the time, however, treatments may help treat MS attacks, manage symptoms and reduce progress of the disease [1].

Symptoms vary widely, depending on the amount of damage and the nerves that are affected. Multiple sclerosis can be difficult to diagnose early in the course of the disease because symptoms often come and go — sometimes disappearing for months.

Multiple sclerosis symptoms may include: numbness or weakness in one or more limbs, partial or complete loss of central vision, usually in one eye, often with pain during eye movement (optic neuritis), double vision or blurring of vision, tingling or pain in parts of your body, electric-shock sensations that occur with certain head movements, tremor, lack of coordination or unsteady gait, slurred speech, fatigue & dizziness [2].

Most people with multiple sclerosis, particularly in the beginning stages of the disease, experience relapses of symptoms, which are followed by periods of complete or partial remission.

Some people have a benign form of multiple sclerosis. In this form of the disease, the condition remains stable and often doesn't progress to serious forms of MS after the initial attack.

The cause of multiple sclerosis is unknown. Several factors may increase your risk of developing multiple sclerosis, including: age, gender, family history, certain infections, ethnicity, geographic regions & other autoimmune diseases [3-4].

In some cases, people with multiple sclerosis may also develop: muscle stiffness or spasms, paralysis, most typically in the legs, problems with bladder, bowel or sexual function, mental changes, such as forgetfulness or difficulties concentrating, depression & epilepsy [5].

Ongoing research is attempting to identity pathology type in MS patients using flow cytometry. They try to investigate the possible prognostic value of ploidy in humans and the disruptions occurring inside the cell cycle with flow cytomety as a diagnostic tool. Flow cytometry enables rapid quantification of DNA content of individual cells, and the cellular DNA content provides useful information about the ploidy, expressing the modal DNA value, and the proliferative activity in a tissue. The ability of flow cytometry to estimate cellular DNA content is based on the measurement of fluorescence from dyes which bind in a stoichiometric manner to DNA [6-7]. As the DNA content is duplicated prior to cell division, mathematical models have been derived which can estimate the percentage of cells in different phases of the cell cycle. Using flow cytometry for DNA analysis between family members with genetically linked diseases provides fast results, permits multiparameter analysis correlating DNA content with antigen expression, and also provides sensitivity for detecting near-diploid aneuploid peaks [8-9]. The ultimate goal of research in MS is the development of interventions that can improve the lives of those living with MS and prevent or cure MS. However, understanding of the MS disease process is not yet sufficient to predict which therapeutic strategies will be most effective. While the new disease-modifying drugs are a major leap forward, they are not a cure, nor are they effective for all patients. MS remains a mysterious disease with no known pathogen or even known determinants of its severity and course [10]. Basic research provides a crucial foundation for innovative approaches to the discovery of effective therapies. Recommendations for research areas that hold the greatest promise for developing treatments that can prevent or cure MS and for improving the lives of people with MS could be the following: research to understand the basic disease mechanisms, and specifically, the cellular and molecular events of MS; tools for research and diagnosis; research on new therapeutic approaches; research toward improving the lives of people with MS; and programs to promote progress in MS research.

In conclusion: scientists continue their extensive efforts to create new and better therapies for MS. One of the most promising MS research areas involves naturally occurring antiviral proteins known as interferons. Beta interferon has been shown to reduce the number of exacerbations and may slow the progression of physical disability. In addition, there are a number of treatments under investigation that may curtail attacks or improve function. Over a dozen clinical trials testing potential therapies are underway, and additional new treatments are being devised and tested in animal models. The plethora of potential therapeutic agents and the multiplicity of patterns and stages of disease to which each might be applied will demand tailoring of pivotal clinical trial designs to the specific clinical situation. Such tailoring will involve trial duration, selection of outcome measures, and as a consequence, sample size. Modification of the course of MS presents opportunities for five types of interventions: primary prophylaxis in at-risk individual, relapse prevention via immune modulation, relapse limiting, progression altering & neuroprotective and restorative. The foundations of scientific progress are laid in the building and maintenance of the research enterprise. In simplest terms, this means getting the "right" people in the "right" places, and that is the essential role of research managers. For biomedical research, this encompasses five key domains: research funding, human resources,

infrastructure, clinical trials & biotechnology and pharmaceutical firms.

Take home message: living with a chronic condition such as multiple sclerosis can place you on a roller coaster of emotions. Suggestions to help you cope include: maintain normal daily activities as best you can, stay connected to friends and family, continue to pursue hobbies that you enjoy and are able to do. Sometimes, joining a support group, where you can share experiences and feelings with other people who have similar concerns, is a good approach [11-15].

References

1. Zamboni P, Galeotti R, Menegatti E, Malagoni AM, Tacconi G, et al. (2009) Chronic cerebrospinal venous insufficiency in patients with multiple sclerosis. J Neurol Neurosurg Psychiatry 80: 392-399.
2. Barnett MH, Prineas JW (2004) Relapsing and remitting multiple sclerosis: pathology of the newly forming lesion. Ann Neurol 55: 458-468.
3. Barnett MH, Sutton I (2006) The pathology of multiple sclerosis: a paradigm shift. Curr Opin Neurol 19: 242-247.
4. Prineas J (1975) Pathology of the early lesion in multiple sclerosis. Hum Pathol 6: 531-554.
5. Wuerfel J, Paul F, Zipp F (2007) Cerebral blood perfusion changes in multiple sclerosis. J Neurol Sci 259: 16-20.
6. Dressler LG (1990) Controls, standards, and histogram interpretation in DNA flow cytometry. Methods Cell Biol 33: 157-171.
7. Kalodimou VE (2013) Basic Principles in Flow Cytomety, AABB Press.
8. Tsamopoulos N, Kalodimou VE (2013) Chronic Cerebrospinal Venous Insufficiency in Multiple Sclerosis: the hydrostatic-immune paradigm and flow cytometry as a diagnostic tool. J Mult Scler 1: 103.
9. Kalodimou VE, Charalampopoulos G, Bekos V, Takis K, Ghiatas A et al. (2013) Multiple Sclerosis in a 23 Years Old Woman Treated by Venous Angioplasty for Chronic Cerebrospinal Venous Insufficiency: A DNA Study by Flow Cytometry, Cardiol Pharmacol 2: 110.
10. Tucker TW (2011) A physics link between venous stenosis and multiple sclerosis. Med Hypotheses 77: 1074-1078.
11. http://www.mssociety.org.uk/
12. http://www.nationalmssociety.org/
13. http://www.nhs.uk/conditions/multiple-sclerosis/pages/introduction.aspx
14. http://www.ninds.nih.gov/disorders/multiple_sclerosis/multiple_sclerosis.htm
15. http://www.msassociation.org