Round-up of research and other items of interest

Sue Shapland RN, BN

The first two overviews were provided by Sandra Connolly, MSWA Community Nurse.

Can quitting smoking after MS diagnosis improve outcomes?

According to a Swedish study, conducted in September 2015, it does appear that modifying this risk factor, by quitting smoking after diagnosis, is worthwhile. In fact, this study may be the first evidence that quitting smoking may slow progression to secondary progressive MS (SPMS).

The study included 728 people with MS, in the Genes and Environment in MS study in Sweden, who smoked at diagnosis. 332 of these, called continuers, continued to smoke at least one cigarette per day after diagnosis. 118 were people who had stopped smoking within one year of diagnosis. 278 people were not included in the final evaluation because they were classed as intermittent smokers.

Findings

216 people converted to SPMS during the study time. The time to conversion to SPMS, increased by 4.7%, for each year people continued to smoke following diagnosis. Continuers reached SPMS faster (median age 48), compared to quitters (median age 56).

Comment

This adds to already existing evidence, that smoking can speed up MS progression. Quitting can delay the conversion from RRMS to SPMS.

Reference: Ramanuyan. R., Hillert, J., et al. 2015. Effect of Smoking Cessation on Multiple Sclerosis Prognosis. JAMA Neurol September 2015 1-7. Epub.

Australian discovery of MOG antibody marker as determinant of treatment in children with MS

Myelin oligodendrocyte glycoprotein (MOG) is a structural protein that makes up part of the insulating layer (myelin) around neurons (nerve cells). An antibody which attacks MOG (MOG antibody) can occur, which contributes to demyelination in MS and other demyelinating conditions.

MS Research Australia funded research in 2015, looking at MS-like immune conditions in children. The study carried out by Dr Fabienne Brilot-Turville and Professor Russell Dale from the children's hospital at Westmead, resulted in identification of this antibody in the blood. They then tested these groups of children:

- Ten children who tested positive for the MOG antibody
- Nine children who tested negative for the MOG antibody
- A group of children who did not have a demyelinating condition.

Over the course of time, they found that the MOG antibody positive group had more relapses, more disease progression and changes on MRI than those negative to the antibody.

This is valuable information because it implies that if earlier discovery of more aggressive disease progression can be determined, then choices of treatment can be tailored to the severity so that more aggressive treatments can be used in order to suppress the inflammatory processes within the immune system and slow disease progression.

Reference: Brilot_Turville. A., & Dale, R. 2015 Australian researchers find marker for disease severity in an MS-related childhood disease.

From the UK MS Trust Website

Drugs in development:

Anti-LINGO – an experimental drug, given as an infusion or subcutaneous injection every two to four weeks, to promote remyelination of nerve cells. It is thought to promote the development of oligodendrocytes, the cells which maintain the myelin coating around nerves.

A protein called LINGO-1, occurring only in the central nervous system, prevents the development of young cells into oligodendrocytes. Oligodendrocytes are the myelinating cells of the central nervous system (CNS).

Anti-LINGO-1 has been found to block the action of LINGO-1, allowing young cells to mature into oligodendrocytes. This may restore repair of damaged myelin, offering the potential for preventing or possibly reversing disability.

In a phase II study of people diagnosed with optic neuritis, anti-LINGO-1 treatment resulted in a small but significant improvement in transmission of nerve impulses via the optic nerve.

No significant side effects have been seen in early clinical studies.

An additional phase II study is under way, with 419 participants with RRMS or SPMS taking Avonex (interferon beta 1a) once a week in combination with different doses of anti-LINGO-1 or placebo by intravenous infusion every four weeks. This study is due for completion in June 2016.

Ocrelizumab is an experimental drug being tested as a treatment for RRMS and PPMS; taken as an intravenous infusion every six months.

Ocrelizumab is a monoclonal antibody, a type of drug developed to attack specific targets in the immune system.

- In RRMS, ocrelizumab reduced relapse rates by approximately 50% compared to beta interferon
- In PPMS, ocrelizumab reduced 12-week disability progression by 24% compared to placebo

BIOTIN (MD1003) is in phase III trials. A highly concentrated formulation of biotin is under investigation for SPMS and PPMS; it is taken as a capsule, three times a day.

Also known as vitamin H or coenzyme R, biotin is one of the B-group vitamins (vitamin B7). It is necessary for cell growth, the production of fatty acids, and the metabolism of fats and amino acids, the building blocks of proteins. At the cellular level, it activates enzymes involved in energy production and synthesis of myelin.

MD1003 is a highly-concentrated formulation of biotin. The doses being used in clinical trials correspond to 10,000 times the recommended daily intake of biotin.

A small pilot study has provided initial evidence that high doses of biotin might have an impact on disability and progression. A phase III clinical trial showed some evidence of a small improvement in disability.

Preliminary results of a phase III study were reported at a scientific meeting. Investigators recruited 144 people with SPMS or PPMS who were having increasing difficulty with walking and leg weakness.

No significant side effects have been reported so far.

The effect of rhythmic-cued motor imagery on walking, fatigue and quality of life in people with multiple sclerosis: A randomised controlled trial

Motor imagery (MI) is a technique where somebody thinks about moving their body in a certain way without actually moving; a technique commonly used by athletes to rehearse movements and skills to improve performance.

This study investigated the use of MI in people with MS, combined with music with a strong beat or metronome, to see if walking could be improved. 101 participants, in three test groups received MI training session CDs and were told to practice for 17 minutes a day, six days a week for four weeks.

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When compared to participants in the control group those in the MI groups could walk significantly faster and further, as well as reporting improved fatigue and quality of life.

The study demonstrates that using mental imagery and practice to a beat could be a safe and effective way of managing and improving walking difficulties in people with MS.

Findings:
Rhythmic-cued motor imagery improves walking, fatigue and quality of life (QoL) in people with MS, with music-cued motor imagery being more effective.

Seebacher B[1], Kuisma R[2], Glynn A[2], Berger T[3].

Taste dysfunction in multiple sclerosis

Problems with taste and smell are thought to be extremely rare symptoms in MS. As they are interconnected it can be difficult to study them individually.

In this study researchers investigated taste in people with MS to try and determine how common and severe problems are, if MS only affected particular types of taste and if problems with taste could be matched with the locations of brain lesions.

73 people with MS were matched, for age, gender ethnicity and education level, with 73 controls. Testing included sweet, salty, bitter and sour elements with participants asked to identify the taste and how strong it was.

Findings
This study demonstrated that more people with MS could have problems with taste than previously thought.

Of the participants with MS, 15% had difficulty identifying the bitter taste, 22% the sour taste, 25% the sweet taste and 32% the salty taste. Those participants who had more trouble identifying tastes also had a larger volume of lesions as seen on MRI brain scans.

The authors highlighted the importance of being able to taste. If you can't taste food properly you could potentially eat something unsafe and you may not enjoy your food if it doesn't taste 'right'. This could potentially lead to people cutting out certain foods which could lead to malnutrition, a common condition that occurs when the diet does not contain the right amount or balance of nutrients for health.

Doty RL, Tourbier IA, Pham DLet al.

Journal of MS Care

An Exploratory Investigation of Social Stigma and Concealment in Patients with Multiple Sclerosis

The researchers conducted a preliminary investigation into dimensions of stigma and their relation to disease concealment in a sample of American adults living with multiple sclerosis.

Fifty-three adults with MS, aged 23-71 years, completed an online survey assessing anticipated, internalised, and isolation stigma, as well as concealment.

The researchers identified that as MS symptoms may not be visible to others, particularly early in RRMS, people may try to conceal their disease. Concealment may prevent discrimination but can also be stressful, with negative consequences for physical health and disease progression. Concealment can also undermine opportunities for social support and increase depressive symptoms.

Findings
Many adults living with MS may be concerned they will be the target of social stigma because of their condition. These concerns are associated with disease concealment. More research is needed to investigate how MS stigma and concealment may be independent contributors to health in patients with MS.

Cook JE[1], Germano AL[1], Stadler G[1]

Associations Between Fatigue and Disability, Functional Mobility, Depression, and Quality of Life in People with Multiple Sclerosis

Fatigue is a common symptom in people with MS, but its associations with disability, functional mobility, depression, and QoL remain unclear. This group aimed to determine the associations between different levels of fatigue and disability, functional mobility, depression, and physical and mental QoL in people with MS.

Eighty-nine participants, with an average length of disease of 13.6 years and Expanded Disability Status Scale (EDSS) score of 5.3 were assessed for levels of fatigue.

Hina Garg, PT, MS, PhD; Steffani Bush, BS; Eduard Gappmaier, PhD, PT

MS Research Australia

Australian Research Unlocks genetic mechanism behind Vitamin D and its role in MS

New research published in the Journal of Genes & Immunity has identified the genetic switch which shows how immune cells are controlled by vitamin D and sheds light on how vitamin D may be used as a therapy for MS.

The research group at the Westmead Institute for Medical Research says it has long been known that vitamin D deficiency is associated with autoimmune conditions such as MS but until now researchers did not know the exact biological mechanism for this association.

The team led by Professor Booth identified three known MS risk genes, which control vitamin activation, are specific myeloid cells; a type of immune cell found in the skin and lymph nodes. This discovery will hopefully help in the development of more targeted treatments.

Science Daily

Exercising Impacts on Fatigue, Depression, and Paresthesia in Female Patients with Multiple Sclerosis

A study conducted jointly by researchers at the University of Basel and Kermashah (Iran) showed that exercise can have a positive influence on certain MS symptoms. Fifty-four women with MS, average age of 34, were assigned to one of three groups: yoga, aquatic exercise or no exercise. Patients who did yoga and aquatic exercise suffered less from fatigue, depression and paresthesia reported researchers.

Breakthrough may stop multiple sclerosis in its tracks

An international research team has demonstrated that a new plant-derived drug can block the progression of an MS-like illness in animals. The experimental drug is a new approach to treating autoimmune disorders, and could be another oral method to treat MS. The plant-based compound is active even when ingested orally rather than requiring injections. The research team expects that they may be able to begin testing the drug in clinical trials in 2018.

Medicine & Science in Sports & Exercise, 2016; 48 (5): 796 DOI:

MS Society Canada

Pilot study takes a first step towards understanding how bacteria in the gut influence childhood MS

The bacteria living in our gut – our gut's microbiome – and our immune system are inextricably linked: the microbiome can influence the immune system, while the immune system keeps the microbiome in check. Growing evidence suggests that in some cases, shifts in the composition or number of bacteria in the gut can drive a fundamental change in immune cell behaviour, leading to inflammation and, for some individuals, MS.

This pilot project was an important first step in establishing a relationship between the absence of specific bacteria and the risk of relapse in paediatric MS. Dr Tremlett's findings tie into a larger narrative, one where abnormal changes in the gut microbiome act not only as potential triggers and drivers for paediatric MS, but for all individuals who are at a higher risk of developing MS.

Tremlett H et al. (2016) Gut microbiota composition and relapse risk in paediatric MS: A pilot study. Journal of the Neurological Sciences. 363: 153-157.