



175 Bloor Street East
Suite 700, North Tower
Toronto, Ontario M4W 3R8
Telephone: (416) 922-6065
Fax: (416) 922-7538
www.mssociety.ca

Medical Update Memo

October 12, 2004

University of Calgary led study suggests ancient viral protein may be part of multiple sclerosis development

SUMMARY

What sets off the destruction within the central nervous system during the multiple sclerosis process remains a central question. A recently published study suggests that a protein called syncytin, which is produced by a virus that has existed within human genetic material for more than 20 million years, may play a key role in the attack on the myelin protective covering of the brain and spinal cord and on myelin-making cells themselves. Dr. Christopher Power, and MS Society studentship recipient Joseph Antony, University of Calgary, and colleagues report the findings in the October 2004 issue of *Nature Neurology*. The overall work was supported by the Multiple Sclerosis Society of Canada. Working with cell cultures and animal models, they found an anti-oxidant called ferulic acid reduced the death of myelin-making cells. This work provides more insights into how the disease progresses and points to possible new approaches to treatment.

DETAILS

What triggers the damaging attack on the myelin protecting covering of the brain and spinal cord and on myelin-making cells (oligodendrocytes) is still unknown. The unpredictable attacks and numerous symptoms result from an inflammatory process that arises within the immune system. Many suggest that MS results through an autoimmune process in which exposure to an external virus or bacterium may trigger the disease process, possibly through molecular mimicry. A protein in a virus or bacterium may be similar to a protein within the body, thus triggering the autoimmune response. Within the immune system, T cells and other immune cells are thought to lead the attack on myelin and myelin-making cells.

A recently published study by an international team of researchers including Dr. Christopher Power and Joseph Antony, University of Calgary, suggests that a protein called syncytin may play a key role in this attack (*Nature Neurology*, Vol. 7, No. 10, October 2004). The international research group is from the University of Calgary, University of Alberta, University of Kentucky, University of Oxford and Ecole Normale Supérieure de Lyon, France. Mr. Antony holds a research studentship from the Multiple Sclerosis Society of Canada. The overall research was supported by the MS Society of Canada and the Canadian Institutes of Health Research.

Syncytin is produced by the body from a virus embedded in humans during evolution more than 20 million years ago. It is known to have an important role in the developing placenta, but a further role in the central nervous system has not been identified until now.

The researchers found that levels of syncytin were significantly higher in brain tissue samples from three people with MS, compared to tissue samples from people with Alzheimer disease, HIV encephalitis or without a neurological condition. Syncytin expression was increased specifically in areas where myelin-damage was actively occurring.

Syncytin was shown to induce the production of oxidants, molecules that can be toxic to certain cells. The researchers found that adding syncytin to cell cultures of myelin-making cells resulted in the death of these cells. They also found they could prevent this toxicity by adding an anti-oxidant called ferulic acid, an anti-inflammatory drug or by substances that inhibit nitric oxide production.

They also worked with mice to find out if syncytin can cause demyelination in an animal model. Mice injected with a syncytin-producing virus resulted in myelin damage and impaired motor function. When mice were given ferulic acid, the treatment markedly reduced the death of myelin-making cells and motor function improved in the mice.

This study suggests that syncytin may be involved in the process of active myelin destruction or that it may block attempts by myelin-making cells to produce new myelin. It also points to possible uses for ferulic acid or similar substances in blocking myelin damage or in boosting remyelination.

Disclaimer

The Multiple Sclerosis Society of Canada is an independent, voluntary health agency and does not approve, endorse or recommend any specific product or therapy, but provides information to assist individuals in making their own decisions.

In an accompanying editorial, Drs. Mark Mattson and Dennis Taub, National Institute on Aging, Baltimore, noted that although the study found an association between syncytin and the inflammatory processes that occur in MS, it did not establish a role for the protein in the development of the disease. Further studies will be required to confirm these interesting findings which could open new avenues of investigation into the underlying disease process and possible new treatment approaches.

ASK MS Information System Code:

2.7.i

National Research Department

National Communications & Government Relations Department

Disponible en français.