

Potential impact of cinnamon on multiple sclerosis studied

June 22 2011

A neurological scientist at Rush University Medical Center has received a grant from the National Institutes of Health (NIH) to evaluate whether cinnamon, a common food spice and flavoring material, may stop the destructive process of multiple sclerosis (MS).

The two-year, \$750,000 NIH grant will fund research that will analyze the effects of cinnamon on the disease process in mice.

"Since medieval times, physicians have used cinnamon to treat a variety of disorders including arthritis, coughing and [sore throats](#)," said Kalipada Pahan, PhD., who is the Floyd A. Davis professor of neurology at Rush and principal investigator of the study. "Our initial findings in mice indicate that cinnamon may also help those suffering from MS."

MS is an autoimmune disease that attacks the [central nervous system](#), which consists of the brain, spinal cord and optic nerves. The disease is caused by damage to the myelin sheath, which is a [fatty tissue](#) that surrounds and protects the nerve cells. When myelin or the [nerve fiber](#) is damaged or destroyed, the [nerve impulses](#) are slowed down and the [electrical impulses](#) to and from the brain are disrupted. This disruption causes the symptoms of MS, which include numbness in the limbs, paralysis and loss of vision.

The progress, severity and specific symptoms of MS are unpredictable and vary from one person to another. Episodes can last for days, weeks or months. These episodes alternate with periods of reduced or no

symptoms. Because nerves in any part of the brain or spinal cord may be damaged, patients with MS can have symptoms in many parts of the body including muscles, bowel and bladder, eyes, speech, and swallowing.

Researchers are not sure what triggers the disease. The most common theories point to a virus or [genetic defect](#), or a combination of both. Geographic studies indicate there may be an [environmental factor](#) involved.

Glial cell activation in the brain has been implicated in the pathogenesis of a variety of [neurodegenerative diseases](#) such as Alzheimer's disease, Parkinson's disease and MS. Activated glial cells accumulate and secrete different neurotoxin factors that cause various autoimmune responses that lead to brain injury.

"These autoimmune reactions in the brain ultimately kill oligodendrocytes, which are a certain type of brain cell that protects the [nerve cells](#) and [myelin sheath](#)," said Pahan. "However, cinnamon has an anti-inflammatory property to counteract and inhibit the glial activation that causes brain cell death."

In earlier published studies, Pahan has been able to show that sodium benzoate, which is a metabolite of cinnamon, can inhibit the expression of various pro-inflammatory molecules in brain cells and block the disease process of MS in mice.

Different doses of sodium benzoate were mixed into drinking water since it is highly soluble and non-toxic, and administered to the mice. Sodium benzoate suppressed the MS clinical score by more than 70 percent and inhibited incidence of MS by 100 percent in the animal model. Results of the initial studies were published in past issues of the *Journal of Immunology*.

According to the National [Multiple Sclerosis](#) Society, 400,000 people in the U.S. are affected by MS, which is diagnosed between the ages of 20 and 40, but can be found at any age. Although the disease is not fatal, it causes muscle weakness, tremors, loss of vision, cognitive changes, depression and other problems. About half of patients with MS become wheelchair bound within 15 years of disease onset and during the last stages of the disease, patients are bedridden. People with a family history of MS and those who live in a geographical area where MS is more common have a slightly higher risk of the disease.

Current medications to treat the symptoms of MS are Interferon-B, Copaxone and Tysabri.

"These medications are expensive, have many side effects, and are only 30-40 percent effective in patients," said Pahan. "If our study is successful, there may be a day when just a teaspoonful of ground cinnamon per day with milk, tea or honey, may help MS patients manage the disease process and significantly cut down the drug cost drastically to \$10 per month per patient."

Cinnamon is safe and has several advantages over currently approved MS drugs. It is not only less expensive, but is non-toxic and can be administered orally rather than through a painful injection.

"The most devastating nature of this disease is that it affects young people just starting their careers and families," said Pahan. "There is no other disease in the world that has such an impact on the quality of lives of young, vibrant adults. This is what motivates me to study this disease."

Provided by Rush University Medical Center

Citation: Potential impact of cinnamon on multiple sclerosis studied (2011, June 22) retrieved 20 April 2024 from

<https://medicalxpress.com/news/2011-06-potential-impact-cinnamon-multiple-sclerosis.html>

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