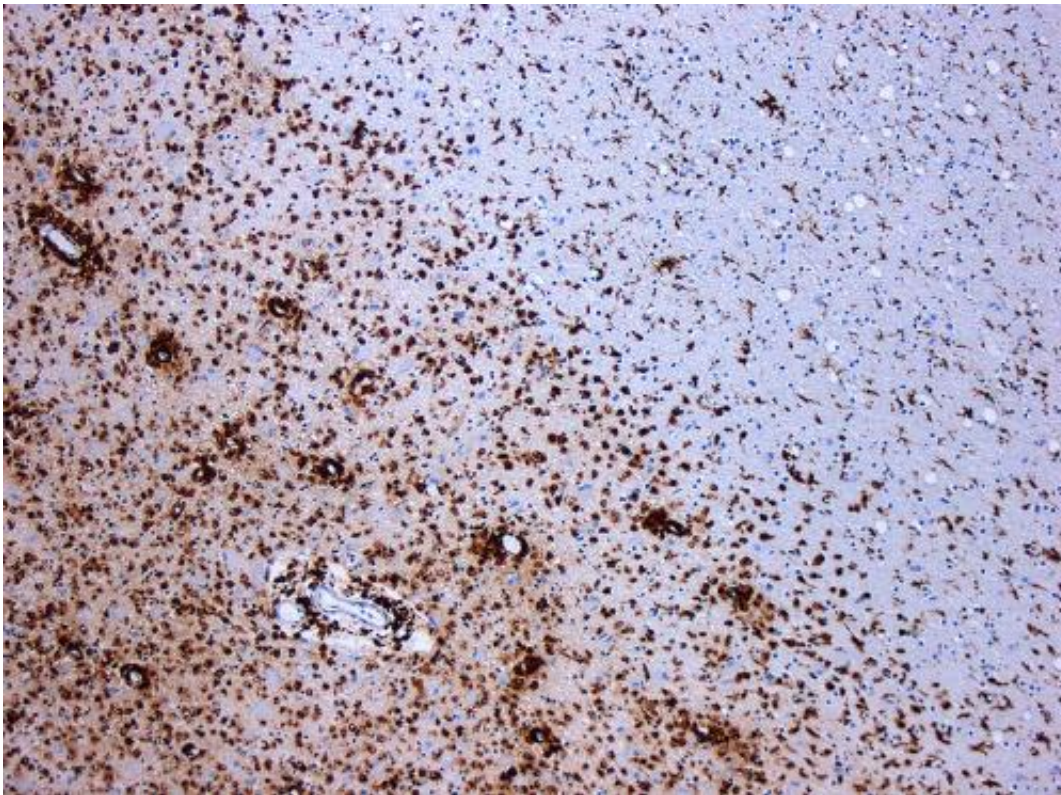


Vegetable-rich diet lowers fatigue in multiple sclerosis patients by raising good cholesterol

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Demyelination by MS. The CD68 colored tissue shows several macrophages in the area of the lesion. Original scale 1:100. Credit: [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/) Marvin 101/Wikipedia

Higher levels of blood high-density lipoprotein (HDL)—or good cholesterol—may improve fatigue in multiple sclerosis patients, according to a new University at Buffalo-led study.

The [pilot study](#), which investigated the effects of fat levels in blood on [fatigue](#) caused by multiple sclerosis, found that lowering total cholesterol also reduced exhaustion.

The results, published recently in *PLOS ONE* and led by Murali Ramanathan, Ph.D., professor in the UB School of Pharmacy and Pharmaceutical Sciences, highlight the impact that changes in diet could have on severe fatigue, which impacts the majority of those with multiple sclerosis.

Fatigue is a frequent and debilitating symptom for people with multiple sclerosis that affects quality of life and ability to work full time. Despite its prevalence and the severity of its impact, treatment options for fatigue are limited. The medications used to treat severe fatigue often come with unwanted side effects.

"Fatigue in people with multiple sclerosis has been viewed as a complex and difficult clinical problem with contributions from disability, depression and inflammation. Our study implicates lipids and fat metabolism in fatigue," said Ramanathan. "This is a novel finding that may open doors to new approaches for treating fatigue."

In previous studies, Terry Wahls, MD, clinical professor of internal medicine and neurology and creator of the Wahls Protocol diet, and her team of researchers at the University of Iowa, showed that a diet-based intervention accompanied by exercise, stress reduction and neuromuscular electrical stimulation (NMES) is effective at lowering fatigue. However, the physiological changes underlying the improvements were unknown.

The researchers examined changes in body mass index (BMI), calories, total cholesterol, HDL, triglycerides, and low-density lipoprotein (LDL)—commonly known as bad cholesterol. Fatigue was measured on

the Fatigue Severity Scale.

The study followed 18 progressive multiple [sclerosis](#) patients over the course of a year who were placed on the Wahls diet, which is high in fruits and vegetables. The diet encourages the consumption of meat, plant protein, fish oil and B vitamins. Gluten, dairy and eggs are excluded.

Participants also engaged in a home-based exercise program that included stretches and [strength training](#), NMES to stimulate [muscle contraction](#) and movement, and meditation and self-massages for stress reduction. However, adherence to the diet was the main factor associated with reductions in fatigue.

"Higher levels of HDL had the greatest impact on fatigue," said Ramanathan, "possibly because [good cholesterol](#) plays a critical role in muscle, stimulating glucose uptake and increasing respiration in cells to improve physical performance and muscle strength."

Patients consumed fewer calories and experienced decreases in BMI and triglyceride and LDL levels as well. However, these factors were found unrelated to changes in fatigue.

The results provide the basis for a larger study that could examine the effects of metabolic changes on fatigue.

More information: Kelly Fellows Maxwell et al, Lipid profile is associated with decreased fatigue in individuals with progressive multiple sclerosis following a diet-based intervention: Results from a pilot study, *PLOS ONE* (2019). [DOI: 10.1371/journal.pone.0218075](https://doi.org/10.1371/journal.pone.0218075)

Provided by University at Buffalo

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