

MS Linked to Lower Levels of Key Nutrients

Pauline Anderson | March 03, 2015

Compared with healthy controls, women with multiple sclerosis (MS) have lower levels of folate, magnesium, vitamin E, and other nutrients that may have important anti-inflammatory or antioxidant properties, a new study shows.

"It's unclear if deficiencies in these nutrients cause MS or are a consequence of it," said lead researcher Sandra D. Cassard, ScD, research associate, Johns Hopkins School of Medicine, Baltimore, Maryland. "These results may also just be coincidental."

More research is needed to clarify the relationship, she said.

Their findings will be presented in April at the upcoming 67th American Academy of Neurology (AAN) Annual Meeting in Washington, DC.

The study included 27 patients with relapsing-remitting MS and 30 healthy controls who were participants in a vitamin D3 supplementation study. Participants were white women aged 18 to 60 years with 25-hydroxyvitamin D levels of 30 ng/mL or less and body mass index (BMI) less than 30 kg/m² at screening.

At baseline, participants completed the validated Block 2005 Food Frequency Questionnaire, which asks about diet and nutrition over the previous year. They then began taking oral vitamin D3, 5000 IU/day, for 90 days.

This analysis focused on intake of five nutrients:

- **Folate:** This water-soluble B vitamin found naturally in foods such as beans and lentils helps make red blood cells.
- **Magnesium:** A mineral found in foods such as raw spinach, nuts, seeds, and mackerel fish, magnesium helps to keep muscles and nerves healthy.
- **Lutein-zeaxanthin:** Found together in green leafy vegetables and other foods, they are potent antioxidants. Occurring in especially high concentrations in the eye, they are thought to be crucial to healthy vision.
- **Quercetin.** A flavonoid phytoestrogen with antioxidant and anti-inflammatory properties, this nutrient, found in such foods as capers and onions, has potential immunomodulatory and neuroprotective effects.
- **α-Tocopherol.** The dietary form of vitamin E is found in vegetable oils, wheat germ, and other foods. This antioxidant has the potential to attenuate demyelination.

The researchers found that compared with controls, participants with MS had a significantly lower mean intake of all of these nutrients.

Table. Food Intake of Nutrients in Patients With MS vs Controls

Nutrient	Patients With MS	Controls	P Value
Food folate (µg)	243.9	321.4	.01
α-Tocopherol (mg)	6.7	8.1	.03
Magnesium (mg)	254.3	321.2	.01

Lutein-zeaxanthin (μg)	3634.7	5384.6	.01
Quercetin (mg)	5.8	11.6	<.001

While the most significant finding was for the comparison of quercetin between the groups, "no conclusions should be derived from P values alone," stressed Dr Cassard.

However, she said, "lower levels of these nutrients in the diets of MS patients compared to healthy controls suggest areas warranting further research."

Not only did patients with MS have lower intakes of certain nutrients than their healthy counterparts, but they fell below recommended dietary allowances (RDAs) for many of these nutrients. However, all study participants had lower intakes of folate and α -tocopherol than the RDAs. Patients with MS also fell below RDA intake of magnesium.

Patients with MS had lower mean percentage of kilocalories from fat than controls (36.7% vs 40.3%; $P = .04$). Dietary sodium intake was similar between the two study groups.

Dr Cassard noted that the results are unadjusted for BMI. Patients with patients had a higher BMI than controls (25.3 vs 23.6 kg/m^2 ; $P = .03$).

Free Radicals

Dr Cassard speculated on how the lack of certain nutrients might affect the disease process in MS. "Free radicals are believed to play a role in demyelination and axonal damage in MS," she explained. "Some of these nutrients have antioxidant properties, which may interact with free radicals, inhibiting potentially damaging effects."

It's possible, said Dr Cassard, that MS itself depletes the body of nutrients or in some way inhibits their absorption. However, she pointed out that the differences found in the study were based on self-reported diet history over the previous year, not on measurement of nutrients from body fluids.

Results are preliminary and further research is needed before neurologists start recommending dietary modifications to patients with MS, said Dr Cassard.

The larger vitamin D study should shed more light on the possible link between vitamin D deficiency and MS, said Dr Cassard. "Those results are being reported separately and the manuscript is currently under review."

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