August 2019 Newsletter

Accelerated Cure project for multiple sclerosis

Accelerating research towards a cure for multiple sclerosis

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Dietary Supplements in MS – Do They Help?

According to Merriam-Webster, a dietary supplement is defined as "a product taken orally that contains one or more ingredients that are intended to supplement one's diet and are not considered food." This includes vitamins, minerals, herbs, amino acids, enzymes, and many other products. With the exception of vitamin D (which will be discussed later), researchers believe it is best to get the nutrients your body needs from eating a healthy, balanced diet. Even though synthetic vitamins are made to have the exact chemical composition of naturally occurring ones, food is a complex source of nutrients that all work together. In contrast, dietary supplements tend to work in isolation. In addition, while some supplements may help supply adequate amounts of essential nutrients, it's important to remember they can't take the place of the variety of foods that are important to a healthy diet.

Vitamins are classified in two groups. Water-soluble vitamins, as the name implies, dissolve in water and are not stored in the body. This group includes all of the B vitamins and vitamin C. If an individual consumes more of a water-soluble vitamin than they need, the excess is excreted. Because they are not stored in the body, people who choose to take them should do so regularly. Fat-soluble vitamins, on the other hand, dissolve in the fat tissue of the body and

are stored there until the body needs them. This group includes vitamins A, D, E and K. Because fat-soluble vitamins can build up in the body, it's important not to consume too much of them.

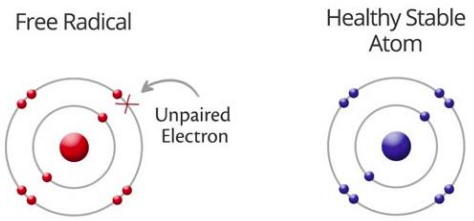
Vitamins or minerals taken at a certain dose may be beneficial. However, taken at a higher dose, the same vitamin or mineral may be harmful. The Food and Nutrition Board of the National Academy of Sciences has established a recommended daily allowance (RDA) for vitamins and minerals. This represents the minimum amount of a nutrient per day necessary for maintenance of good health. In general, it is important to discuss which supplements are most appropriate (including dosage) with your healthcare team before taking them, just as you would any other medication.

In the United States, dietary supplements are not evaluated by the Food and Drug Administration (FDA) for safety and efficacy in the same rigorous way that medications are. Because of this, labels on these products are not permitted to make specific claims about their ability to treat or cure any particular illness. Manufacturers of supplements are not required to prove the effectiveness of their products, or accurately report what is contained in them. As a result, supplements may vary widely in both the amount and quality of their ingredients.

A number of vitamins, minerals and herbal supplements are of interest in MS. However, it is important to note that there is a lack of sufficient evidence to make recommendations regarding the effectiveness and safety of any of them for all people with MS. In general, any supplement that claims to boost or improve the immune system should be avoided because MS is an autoimmune disease in which the immune system is already "hyperactive."

Vitamin D is important for absorption of calcium and for bone growth, and has an important role in cell, neuromuscular and immune function. There are two main forms of Vitamin D, which are D2 (also known as ergocalciferol) and D3 (known as cholecalciferol). Regular sun exposure is the most natural way to get enough vitamin D, however, too much sun is associated with health risks. Dietary sources include fish, cheese, mushrooms and egg yolks. Some foods that don't naturally contain vitamin D are fortified with this nutrient, such as milk and some breakfast cereals. Supplements can also help increase intake, in which case vitamin D3 is generally considered the preferred form. The RDA for

vitamin D is 600–800 international units (IU) for adults. The generally accepted safe upper limit for daily vitamin D intake is 4,000 IU, however higher amounts may be recommended based on specific circumstances. Symptoms associated with vitamin D toxicity may include a buildup of calcium in your blood (hypercalcemia), which can cause nausea and vomiting, weakness, frequent urination, bone pain and the formation of kidney stones. Research shows higher vitamin D intake and higher vitamin D levels are associated with lower risk of developing MS as well as reduced disease activity. People with MS are also at increased risk for bone loss (osteopenia and osteoporosis), for which vitamin D supplementation may be of benefit. People with MS should talk with their healthcare providers about whether blood testing of vitamin D levels and supplementation would be of benefit.



Antioxidant vitamins decrease the damage caused by oxidants or free radicals. A free radical is a molecule in the body that has an unpaired electron. These molecules are very unstable because they are constantly trying to pair their unpaired electron. This causes them to react with other cells in the body, resulting in oxidative damage. Free radicals contribute to illness and aging. Studies suggest that the damage caused by free radicals may be involved in the disease process in MS. However, there are no well-documented published studies of people with MS that show a clinical benefit related to antioxidant supplements. In fact, this class of vitamin is known to stimulate the immune system, which (as mentioned earlier) is not recommended for people with MS.

Antioxidant Vitamins

Vitamin A is important for maintaining healthy vision and proper function of the immune system, among other things. Dietary sources include cod liver oil, eggs, as well as orange and yellow vegetables and fruits. The RDA for men and women ranges from 2,300 to 3,000 IU and daily intake should not exceed 10,000 IU. Pregnant women, in particular, should not consume high amounts of vitamin A, as there is evidence this may produce birth defects. In MS, research shows vitamin A does not play a role in the disease course of RRMS.

Vitamin C, also known as ascorbic acid, is necessary for the growth, development and repair of all body tissues. It's involved in many body functions, including the immune system. Vitamin C is readily available in foods such as citrus fruits and tomatoes. The RDA for this vitamin is 90 milligrams (mg) for men and 75 mg for women. Interestingly, the RDA for smokers includes an

additional 35 mg. Daily doses greater than 2,000 mg may cause diarrhea or even kidney damage. Researchers have long believed that vitamin C may be useful in helping prevent urinary tract infections, which frequently occur in people with MS, by making urine more acidic and making it more difficult for bacteria to colonize the urinary tract. However, recent research indicates that vitamin C does not acidify urine. There is more evidence to support the use of cranberry to prevent urinary tract infections than there is for vitamin C (see the herb section of this article). With regards to this vitamin's role in the treatment of neurological diseases such as MS, researchers have found it to have benefit in animal studies, however it hasn't been studied sufficiently in humans to make a definitive conclusion.

Vitamin E plays many important roles in the body, including helping to keep the immune system strong against viruses and bacteria. It can be found in such foods as vegetable oils, nuts, seeds and green leafy vegetables. The RDA for vitamin E is 22 IU for both men and women. A diet high in polyunsaturated fatty acid (PUFA), which is thought to be beneficial in MS, increases the RDA by approximately 0.9–1.3 additional IU of vitamin E for each additional gram of PUFA consumed. Daily vitamin E doses greater than 1,500 IU should be avoided. One study identified an increased mortality among consumers of 400 IU or more of vitamin E. Another study shows vitamin E may increase the risk of lung cancer in people that smoke. With regards to MS, Norwegian researchers found that increased levels of vitamin E are associated with reduced odds for MRI-detected disease activity in RRMS patients undergoing interferon beta-1a treatment.

Vitamin B6, also known as pyridoxine, helps to maintain a healthy metabolism, as well as healthy skin and eyes. This vitamin also supports nerve and liver function. Foods rich in vitamin B6 include fish (especially salmon and tuna fish), pork, chicken, beans and bananas. The RDA for vitamin B6 is 1.3–1.7 milligrams for adults ages 19–50. It's important to note that high doses of pyridoxine can cause nerve symptoms that mimic MS, such as numbness, tingling or pain. These symptoms are reversible once supplementation is decreased.

Vitamin B12, also known as cobalamin, is key to the normal function of the brain and nervous system. It is also involved in the production of red blood cells and DNA, the genetic material in all cells. Vitamin B12 is naturally found in animal products, such as fish and organ meat, but not in plant-based foods. Fortified breakfast cereals are another potential source. The RDA for cobalamin is 2.4 micrograms for both men and women. Research suggests that people with MS may have low levels of vitamin B12, compared to the general population, indicating there may

be a relationship between the two. Vitamin B12 deficiency can be evaluated through a blood test. People with MS who have low levels might benefit from vitamin B12 supplementation. For people with MS with normal levels, there is no evidence that vitamin B12 supplementation either improves neurological symptoms or favorably alters the course of the disease.

Minerals are inorganic nutrients. Macrominerals are the minerals your body needs in large amounts, such as calcium and magnesium. Minerals needed in only small amounts are called trace minerals.

Minerals

Selenium is a trace mineral that has antioxidant effects, and it also plays an essential role in the production of thyroid hormone. Good sources include legumes, seafood, whole grains, lean meats, and dairy products. For those 14 years of age and older, the RDA of selenium is 55 micrograms. Toxic effects may occur with daily doses greater than 400 micrograms. Given its antioxidant properties, selenium may also stimulate the immune system, which, as mentioned earlier, is already overactive in people with MS. Research suggests that selenium levels may be lower in people with MS than in the general population, however it is unclear whether selenium supplements would benefit those with MS.

Calcium is the most abundant mineral in the human body. It plays a key role in the formation of teeth and bone, as well as muscle contraction, transmitting messages through the nerves and the release of hormones. Dietary sources of calcium include dairy products, leafy vegetables, and eggs. The RDA for adults is 1,000–1,200 mg of calcium per day. Calcium taken in excess amounts (more than 2,000 mg) may result in toxic effects. There is no scientific evidence to support the once held hypothesis that consuming large amounts of calcium during childhood (milk and other dairy products) followed by a sudden decrease in consumption at adolescence causes MS. However, people with MS are at increased risk for bone loss (osteoporosis), so adequate calcium intake is crucial.

Zinc is a trace mineral needed for a healthy immune system. It plays a role in cell division, cell growth, wound healing and the breakdown of carbohydrates. Zinc is also needed for the senses of smell and taste. Meat and shellfish are excellent sources of zinc, as are whole grains and dairy products. The RDA for zinc is 11 mg for men and 8 mg for women. High intake of zinc can result in copper deficiency, which may result in MS-like neurologic symptoms. A recent study

in an animal model of MS suggests that zinc is involved in spinal cord demyelination and in generation of motor deficits. More research is needed to demonstrate these effects in humans.

An herb is a plant, or part of a plant, that can be used for medicinal purposes. Herbs, like drugs, interact with the cells of the body and can sometimes produce changes in body processes. It is important to recognize that there are many unknown aspects to herbs. Their effects may be beneficial, but they can also be harmful. Herb users should be aware of proper dosing, potential side effects, and how the herbs consumed may react with drugs, as well as other herbs.

Herbs

Ginkgo Biloba comes from one of the oldest tree species and has been used in China for medicinal purposes for thousands of years. Ginkgo is a known antioxidant. It also inhibits a substance known as platelet activating factor, which in turn causes a decrease in the activity of certain immune cells. This mechanism of action is why some recommend this herb as a therapy for MS. Recent clinical studies surrounding the therapeutic benefit of this herb have had mixed results. One suggested a benefit with regards to fatigue, symptom severity and functionality in some individuals with MS. Another showed that treatment with ginkgo biloba does not improve cognitive performance in people with MS. It's important to note that ginkgo may interact with many different prescription medications so its use should be discussed with healthcare providers.

Echinacea is a flowering plant native to North America and a member of the daisy family. Some people believe that it is helpful for decreasing the duration and symptoms of the common cold, but there is no scientific evidence to support this effect. Echinacea appears to stimulate the immune system, by increasing the number of white blood cells (which fight infections). As mentioned earlier, boosting the immune system could theoretically worsen MS, therefore, echinacea is not recommended for people with the disease.

St. John's Wort is a yellow flower that grows in many parts of the world. It is generally used as an antidepressant. This herb is generally well tolerated and has no known effect on the immune system that could be concerning to people with MS, however the herb has known drug interactions with many medications. There is a relatively high incidence of depression among

people with MS and St. John's Wort may be helpful in cases of mild depression. St. John's Wort is not suitable for anyone with severe depression. It is important to recognize that depression should not be self-diagnosed or self-treated, and treatment with St. John's Wort should be done only under a doctor's supervision.

Valerian is a perennial flowering plant native to Europe and Asia. The medicinal part of the plant is its unpleasant-smelling root. Valerian is sometimes used as a sleep aid. People with MS may have difficulty sleeping, and difficulties with sleep may contribute to MS-related fatigue. Thus, a sleep aid may be very useful to some people with MS. Valerian is usually well tolerated. However, its effects on the immune system have not been studied. It's important to note that valerian may have a lingering sedating effect, which may worsen fatigue in some cases. Also, valerian may increase the sedating effects of some prescription medications.

Asian ginseng is a plant that grows in Korea, northeastern China and far eastern Siberia. Its root has been used to make medicine in China for centuries. Ginseng's many beneficial effects supposedly include boosting energy, lowering blood sugar and cholesterol levels, reducing stress, and promoting relaxation. While an herb that increases energy and strength would be of great use to people with MS who sometimes suffer from debilitating fatigue, there is insufficient data to support these benefits. Although some evidence suggests ginseng might reduce fatigue and have a significant positive effect on quality of life in people with MS, other studies raise the possibility that ginseng may stimulate the immune system in ways that may be detrimental to people with MS. Further studies are needed to conclude whether ginseng is safe or not, and to confirm any of its therapeutic effects.

Cranberries are grown in bogs in North America. As alluded to earlier, this herb is frequently used to prevent or treat urinary tract infections. There is an active ingredient in cranberries, proanthrocyanidin, which can prevent adherence of bacteria to the bladder wall. Some, but not all, clinical trials of cranberry have shown that this herb prevents urinary tract infections. Bladder issues are common among people with MS and taking cranberry may be a helpful preventive measure. Increased fluid intake and improved hygiene may also be helpful in this regard. Cranberry has very few side effects and is reasonable for most. Cranberries should never be used to treat existing urinary tract infections. Urinary tract infections can have serious consequences for people with MS and often require antibiotic treatment from a physician.

Dietary supplements may be an attractive option for people with MS in their efforts to manage the disease and its symptoms. However, supplements can cause side effects or harm when taken in combination, at high doses, or when taken instead of prescribed medications. Supplements can also interact with certain prescription drugs in ways that might cause problems. Many contain active ingredients that can have strong effects in the body and the scientific evidence surrounding their benefits is inconclusive. Because supplements are not regulated in this country, being educated and careful about their use is very important. It's important to let your health care providers know which supplements you're taking, and which ones you are considering so you can discuss what's best for your overall health.