

Nutritional Approach to Support MS

Sponsored by MS Center of Atlanta - National Multiple Sclerosis Society

Presented at Armstrong Atlantic University

8/03/04

Presented by Peter Brodhead CN
Brighter Day Natural Foods Market

1102 Bull Street

Savannah, GA 31401

www.Brighterdayfoods.com

912-236-4703

Some facts about MS – Statistics show that the occurrence rate of MS is much higher in the higher latitudes north and south of the equator, where the occurrence rate is 50 – 100 per 100,000 vs. in the tropics the occurrence rate is only 5 to 10 per 100,000. Japan is one exception to the rule where it is uncommon. In Japan the diet is high in Fish, seaweed, seeds, and soy foods. Because of the environmental relationship between latitude and MS, it is hypothesized that a crucial factor is lack of ultraviolet light-induced vitamin D3 synthesis in the skin, and that vitamin D3 acts as a selective immune system regulator that works to inhibit autoimmune disease; therefore in low sunlight conditions, insufficient protective amounts of D3 are manufactured. The authors of the research about vitamin D suggest that further research in this area may suggest the possibility that MS could be prevented in genetically susceptible people through the use of supplemental vitamin D3. (D3 is the natural vitamin D found in fish oil).

The direct relationship between MS mortality and dietary fat, especially saturated fats and animal fats was eloquently described in an extensive study involving 36 countries appearing in the American Journal of Epidemiology in 1995. The MS rate was significantly correlated repeatedly with one or another parameter reflecting the consumption of animal fat, animal protein, and meat from non-marine mammals. These deficiencies in polyunsaturated fats were thought to interfere with the elongation of fats that compose the nerve cell membrane and impair formation of normal myelin. Swanks 1952 study of the direct correlation between the incidence of MS in various districts of Norway and the amount of dairy products consumed by the populations of those specific regions also pointed in the same direction.

MS, like many other diseases of modern civilization, is a disease quite simply caused by an overactive and misdirected immune system. The immune system reacts against protective insulating cover (myelin) of the nerves of the central nervous system and in addition causes damage to the actual nerve body (axon). White blood cells called lymphocytes attack myelin as if it were some invading organisms or foreign substance. When the body's immune system fails to control itself and lymphocytes attack normal body tissue, the disease process that ensues is called an autoimmune disease.

In MS, lymphocytes somehow receive inappropriate signals directing them to attack the brain and spinal cord. The activity of the lymphocytes is regulated by a group of chemicals called prostaglandins.

Prostaglandins (PGs) - Prostaglandins (PGs) are extremely powerful, they affect every aspect of our health through their hormone-like effects, and our body makes them from essential fatty acids (EFAs). Functionally, PGs are short-lived, hormone-like chemicals that regulate cellular activities on a moment-to-moment basis.

Prostaglandins fall into 3 families or series - PG-1, PG-2, & PG-3, depending on which fatty acid they were made from. Series 1 and 2 prostaglandins come from the omega 6 family of fats, with the EFA linoleic acid (LA) as the starting material. Series 3 prostaglandins comes from omega 3 fatty acids –the most important being EPA from Fish Oils. DHA from fish oils are also important. It may be possible to reduce the over activity of immune function in MS by providing dietary sources of the essential fats - part from the omega 6 and omega 3 fatty acid groups so the body has the ability to produce more of the “good prostaglandins” – groups 1 and 3 and thus, control of lymphocyte activity, which plays a critical role in MS.

Functions of Prostaglandins: The role of prostaglandins from groups 1 is to moderate or tone down immune activity and inflammation. Prostaglandins in group 2 on the other hand signal the lymphocytes to become more active in the immune response and induce inflammatory activity. In normal situations

prostaglandins in group 2 activate the white blood cells, but this activity is kept in check by prostaglandins from groups 1 and 3.

Series 1 – prostaglandins made from DGLA (GLA from Primrose Oil, Borage Oil or Black Currant Oil is the direct precursor to DGLA)– the most famous member of the series is prostaglandin E1, or PGE1. PGE1 has important functions in several tissues in our body

- 1- It keeps blood platelets from sticking together, and thereby helps prevent heart attacks and strokes caused by blood clots in our arteries
- 2- In our kidneys it helps remove sodium and excess fluid from our body.
- 3- It relaxes blood vessels, improving circulation, lowering blood pressure and relieving angina.
- 4- It may slow down cholesterol production.
- 5- It decreased inflammation response, helping to control arthritis
- 6- It makes insulin work more effectively, helping diabetics
- 7- It improves nerve function, producing a sense of well-being.
- 8- It regulates calcium metabolism.
- 9- It improves the functioning of T-cells in our immune system, which destroy foreign molecules and cells.
- 10- It prevents the release of AA (Arachidonic Acid) from our cell membranes.

Series 2 – prostaglandins are made from arachidonic acid (AA).

One member PGE12, acts like PGE1, helping to keep platelets from sticking together, but another called PGE2 causes the following:

- 1- PGE2 promotes platelet aggregation, which is the first step in clot formation
- 2- PGE2 induces the kidney to retain salt, leading to water retention and high blood pressure.
- 3- It causes inflammation. PGE2 opposes PGE1 function. It is a “bad guy” Prostaglandin.

PGE1 (GLA as the precursor) inhibits the release of AA from cell membranes where AA is stored - as long as AA remains in membranes, it cannot be converted into series 2 prostaglandins. This prevents the bad effects of PGE2 from occurring.

Note: for added protection from the damaging effects of PG2 prostaglandins, the human body converts DGLA only slowly to AA. Since animal products contain AA, however, a high meat diet works against this protection, making people who consume diets rich in animal products more prone to cardiovascular, inflammatory, and kidney diseases.

Series 3 – prostaglandins are made from eicosapentaenoic acid (EPA). Two members of this series, called PGE3 and PG13, have very weak platelet stickiness (aggregating) effects.

- 1- The most powerful effect of PGE3s is that EPA, their parent, prevents AA from being released from membranes, thereby preventing “bad” PG2s from being made.
- 2- EPA is the single most important factor limiting PGE2 production, and explains why fish oils can prevent degenerative cardiovascular changes, water retention, and inflammation caused by excessive PGE2s

Oil supplements can bypass the block that blocks the conversion to the beneficial anti-inflammatory PGE1 and PGE3. Primrose oil, borage or black currant oil supply the beneficial essential fat GLA and Fish Oil the essential fats EPA/DHA.

Blocks to the conversion of LA(Linoleic Acid) to GLA(Gamma Linoleic Acid)

- 1- Excess cholesterol
- 2- Excess saturated and monounsaturated fats
- 3- Processed vegetable oils – margarines, shortenings and partially-hydrogenated vegetable oils
- 4- Heated oils from frying or deep frying
- 5- Alcohol
- 6- Aging
- 7- Zinc deficiency
- 8- Diabetes and pre-diabetic conditions
- 9- High sugar consumption
- 10- Common viral infections.

The cerebrospinal fluid, a liquid covering the brain and spinal cord, has been shown to contain significantly less linoleic acid in MS patients compared to controls. Linoleic acid (GLA-Gamma Linoleic Acid is derived from this) is the precursor to the prostaglandin 1 group, so its deficiency could allow overactivation of the immune system. Prostaglandins 1 and 3 calm the immune system while prostaglandin 2 is pro-inflammatory. This follows the epidemiological studies describing diet and risk for MS.

Diets based on animal fats, dairy products and animal proteins and alcohol favor prostaglandin 2 formation and are associated with higher rates of MS, more frequent exacerbations, and higher MS-related mortality rates. Diets rich in vegetables, nuts seeds and fish favor the production of prostaglandins 1 and 3, and are associated with lower rates of MS.

Doctors who analyzed the data on linoleic acid supplementation stated in the journal *Neurology*. We have reanalyzed the data from 3 double-blind trials of linoleic acid in the treatment of MS. Our most important finding is that patients with minimal or no disability at entry had a significantly smaller increase in disability over the course of the trials than did control patients. Patients treated with linoleic acid did not have a significant change from the beginning of treatment to the end of the trial, whereas control patients had a significant increase in disability.

The most important precursor of prostaglandin 1 – critically important in controlling the immune system is **GLA – Gamma linoleic acid**. It is the critical precursor and is found in Evening Primrose Oil, Black Currant Oil and Borage Oil. GLA directly influences the production of prostaglandin 1.

Prostaglandin 3 is also very important in reducing the overactive immune response in MS. While much less potent than prostaglandin 1, it nevertheless plays an important role by reducing the activity of inflammation enhancing prostaglandin 2. Flaxseed Oil is 50 – 60 % linolenic acid – but it must be converted into EPA and DHA which is a fairly inefficient process. Under the best of circumstances humans convert only about 2.7% of linolenic acid to EPA/DHA. Vit C, B3, B6, Magnesium and Zinc must be present to convert it. Consumption of Fish Oils is the most effective way to get EPA/DHA in the diet. These essential fatty acids should be kept refrigerated to prevent rancidity. The risk of consuming more fish increases the potential for mercury toxicity (mercury is a neurotoxic heavy metal). So consuming high quality purified fish oils that are mercury free is the safest way to get these essential fats in the diet. The fish that are lowest in mercury according to research done by the EPA and U.S. Department of Health and Human Services and higher in the Omega 3 fatty acids EPA/DHA are Anchovies, Salmon – canned, fresh and frozen (wild salmon are lower in pesticide residues and higher in the beneficial essential fatty acids EPA/DHA look for the word wild on all canned salmon, the vast majority of fresh salmon is farmed), Sardines, Cod, Croaker, Haddock, Herring, Atlantic Mackerel, Pollack, light canned tuna – not albacore-fresh tuna is high. Other fish rated high in mercury are Gulf of Mexico Mackerel, King Mackerel, Swordfish, Shark and Tile Fish. www.cfsan.fda.gov/~frf/sea-mehg.html)

Therapeutic Considerations –

Swank Diet – used since 1948 professor Swank from the Univ. of Oregon created a very successful diet for MS.

The results of Dr. Swank's 34 – year study from 1949 – 1984 are impressive. Patients diagnosed as minimally disabled showed very little progression of the disease. Individuals with the least disability at the start of the study did best: 95% of that group remained only mildly disabled for approximately 30 years. 31% of those individuals that followed the diet group failed to survive the 34 years of the study while a remarkable 80% of those not following the diet failed to survive the same time period. Moderately and severely disabled patients progressed much better subjectively and objectively than those that did not follow the diet. The diet has been credited with preventing a worsening of the disease, greatly reducing fatigue, and substantially reducing the death rate.

The Swank diet calls for:

- No red meat for the first year of the diet (including the dark meat of turkey and chicken). Following the first year, 3oz of red meat will be allowed per week.
- No dairy products containing 1% butterfat or more.
- No processed foods containing saturated fat.
- Saturated fat should never exceed 15 grams (3 teaspoons) per day.
- 1 teaspoon or 4 capsules of cod liver oil or fish oils should be consumed per day.

A daily intake of 20 to 50 grams of polyunsaturated oils per day 4 to 10 teaspoons per day. Fish oil, flax oil, walnut oil, canola, sesame oil, high oleic safflower, and high oleic sunflower oil are good choices.

Keep oils in the refrigerator and out of light. Olive oil is a monosaturated Omega 9 oil should be kept in the dark and doesn't need refrigeration.

Optimum Diet -

The MS diet is essentially vegetarian. Meat products and eggs –(the protein from eggs are an excellent quality use the egg white) enhance the formation of inflammation-producing fatty acids.

Protein sources include cold water fish (see the list of low mercury containing fish above) and vegetable protein including soy products like tofu and soy protein powder and other beans and nuts.

Dairy products should be minimized - if using dairy use skim milk and the lowest fat possible – instead use soy-based cheeses and soy milk instead of cow's milk.

Nuts and seeds are rich sources of the right kinds of essential fats, magnesium and protein – eating them raw is the best way not to alter the beneficial essential fatty acids. Eat lots of dark green leafy vegetables they have smaller amounts of essential fats but are extremely rich in anti-oxidants. All foods rich in essential fatty acids should be emphasized.

Eat Foods that are rich in vitamins C, B3, B6, B12, magnesium and zinc (see the list following this paper) for the proper utilization of essential fatty acids and vitamin E.

Avoid all hydrogenated and partially hydrogenated fats. There are new non-hydrogenated margarines available made from palm fruit oils. Partially hydrogenated oils are rich in trans fatty acids which increase the inflammatory effects of arachidonic acid PG2.

Turmeric (the yellow spice found in curry powder) should be used liberally as a spice and has been found to possibly interrupt the production of IL-12, a protein that plays a key role in signaling immune cells to launch their assault on the myelin sheath. (In Asian countries such as India, China, who are eating more turmeric there are very rare reports of MS). Rosemary as an herb is high in fat-soluble anti-oxidants (like an herbal vitamin E) use it frequently in teas and cooking. Rosemary along with turmeric are excellent at helping the liver with detoxification also.

Alcohol should be eliminated since it enhances the formation of the damaging 2 series of prostaglandins. Alcohol further enhances PG-2 production while less is produced in a diet supplemented with zinc, vitamin C, vitamins B3 and B6 and a good source of EPA/DHA. This is why a low fat essentially vegetarian diet is critical for the MS patient. 75% of myelin is composed of fat, with a substantial amount coming from the essential fatty acids. Creating the most advantageous environment for repair and regeneration of myelin requires an adequate supply of EFA's along with other cofactors like B-12.

Food allergy is a component of the diet that should be considered. One study reported that in 15 individuals with MS, symptoms could be completely controlled or improved by avoidance of allergenic foods, house dust, or tobacco. Other researchers reported that 31% of 49 MS sufferers improved when they avoided allergenic foods. When they re-introduced these foods, symptoms frequently worsened. Wheat and Gluten containing foods should be considered near the top of the list of allergic foods. (ask for the allergy elimination sheet available at Brighter Day – I created it for the parents of hyperactive/ADD children but it will work for any – food allergy problem)

Digestive impairment Many people with MS (over 50% at Dr Jonathan Wright's clinic) are found to have low production of stomach acid or a lack of sufficient pancreatic digestive enzymes. Supplementation of betaine hydrochloride with pepsin with meals and or pancreatic enzymes after meals is recommended for any individual whose tests are abnormal.

Please note: all health issues of diet and supplementation should be discussed completely with your primary health care physician:

Supplements :

Fish Oil Supplements –

Be sure to look for fish oil supplements that have been produced in a nitrogen manufacturing environment to minimize oxidation and have undergone 3rd party evaluation demonstrating the product to be free of heavy metals and PCBs. The new generation of Cod Liver Oil and liquid fish oils have taken a giant leap in quality and flavor – they are no longer obnoxious and fishy tasting. Keep all fish oils refrigerated. Nordic Naturals, Natural Factors, Carlson, Nature's Way, Enzymatic Therapy and Health From the Sun have quality fish oil supplements.

Essential Fatty Acid Supplement – Udo’s Choice Essential Fatty Acid Blend is a blend of Omega 6 and 3’s with trace amounts of 9 – the oils are produced without damaging any of the essential fatty acids. Used in Salads, smoothies, soups (added after cooking) are a way to get the highest quality oils in the diet.

GLA –(Gamma Linolenic Acid) from Borage, Black Currant or Primrose Oil should be 300mg a day.

Vitamin D –Vitamin D3 appears to be the best form to use as a supplement – it is the same form that is from fish liver oils 400IU’s daily. If you are taking a cod liver oil supplement check for the vitamin D content on the label.

Vitamin E – is a very important fat soluble anti-oxidant - when the diet has a high amount of Omega 3 fats in it – it protects the fats from going rancid. Vit. E protects the cell membranes. When purchasing vitamin E be sure to only use the natural form and try to get it with a high amount of mixed tocopherols, natural E has a D’Alpha tocopherol on the label – synthetic has a DL – tocopheryl or dl-tocopheryl, the natural works much better. Try to get a minimum of 200iu’s – 400iu’s is more optimal

B – Complex vitamins support the central nervous system. 50mg is a good therapeutic dose. B3 & B6 are essential for the proper conversion of essential fatty acids

Vitamin B-12 - The general lack of use of vitamin B-12 in the treatment of MS by American physicians parallels their underutilization of the essential fatty acids. In 1957 German researchers published data demonstrating profound deficiencies of B12 in the blood of MS patients. Their results have been repeatedly confirmed with more recent medical publications showing low B12 levels not only in the blood, but also in the cerebrospinal fluid (CSF) of patients with MS. One of the most important functions of vitamin B12 in humans is its role in the formation and maintenance of myelin. B12 is also important in the formation, maintenance and repair of myelin. B12 has a direct stabilizing effect on the immune system. Combining B12 with oral NADH, provides a powerful antidote for the generalized fatigue that so frequently plagues MS patients.. Supplementation in the form of methylcobalamin sublingual 1000mcgs daily was found to be beneficial. Methylcobalamin is a form that has been converted into the active co-enzyme form it is the best form you can buy outside of getting an injection. Consider asking your physician for B-12 injections.

Magnesium and Zinc are essential for the proper conversion of essential fatty acids. The RDA of Magnesium is 400mg a day and Zinc is 15mg a day.

Other nutrient suggestions made by Dr Perlmutter MD – neurologist practicing in Naples Florida and specializing in Nutrition.

Alpha Lipoic Acid – is emerging as one of the most powerful brain antioxidants available. Readily passing the blood brain barrier, lipoic acid is a key nutrient in all the neurodegenerative disorders. Is a key nutrient in his protocol for MS.

Ginkgo Biloba – Ginkgo is useful in virtually all the neurodegenerative conditions due not only to its ability to reduce the activity of free radicals, but also because of its potent effects enhancing neurotransmission, the process by which neurons are able to communicate with each other.

NAC – N-acetyl-cysteine - enhances the production of glutathione, one of the most important brain antioxidants, NAC is a key supplement in MS and all other neurodegenerative conditions.

Phosphatidylserine PS – plays a major role in preserving function of the membrane surrounding the energy producing mitochondria. It enhances the ability of nerves to transmit information.

CoQ10 – the critical role of adequate CoQ10 in facilitating cellular energy production.

References:

Multiple Sclerosis Functional Approaches by David Perlmutter MD

Townsend Letter for Doctors and Patients – Issue # 244 11/03 p-291-294

911 Tyler Street, Pt Townsend, WA 98368-6541 www.townsendletter.com
360-385-6021

Udo Erasmus – Fats that Heal Fats that Kill

P-269-279 1993 14th printing ISBN 0-920470-38-6

[Alive Books 7432 Fraser Park Drive, Burnaby BC Canada V5J5B9 604-435-1919](http://www.alivebooks.com)

Hyperhealth – Computer Program – Nutrition Data Base

[Hyperhealth Pro Version 2.0 \(2002\) P.O. Box 37 Hansville WA 98340](http://www.hyperhealth.com)

The Zone – Barry Sears Phd.

p. 119 – 134 1995 Harper Collins Publisher ISBN 0-06-039150-2

[10E 53rd st., NY, NY 10022](http://www.thezone.com)

Further notes: From David Perlmutter, MD – Perlmutter Health Center, Naples Florida 239-649-7400

Recently the most convincing data ever presented relating infection with a specific organism to MS has been reported from the Department of Neurology and Pathology, Vanderbilt School of Medicine, Nashville, TN. Published in the 7/99 issue of the Annals of

Neurology – have demonstrated Chlamydia pneumoniae in 100% of 37 MS patients. This was substantiated in a study appearing in the 3/03 issue of Epidemiology. A Harvard researcher Kassandra Munger found a 70% increased incidence of MS in women seropositive for the presence of Chlamydia pneumoniae. Two commonly used medications for MS interferon-beta and methotrexate profoundly inhibit the growth of the chlamydia bacterium. The recent development of a very sophisticated test to detect a unique protein found on the cell wall of the organism itself found in the spinal fluid of MS patients – may be why this has taken so long to be discovered. There are specific antimicrobial medicines available to treat Chlamydia pneumoniae. Doxycycline may be the more effective antibiotic because of its ability to penetrate the blood-brain barrier to enter the brain.

Candida albicans may be another contributing factor – in a study done by the author in 1995 8 of 9 patients demonstrated significantly depressed levels of colonic Lactobacillus bacteria. Dysbiosis, an imbalance of gut bacteria – was reported in the Lancet in 1995 which evaluated the frequency of brain MRI changes like those seen in MS (white matter plaques) in patients with inflammatory bowel disease compared to normal non afflicted individuals. Patients with Crohn's disease and ulcerative colitis – not MS were shown to have the same lesions on the brain as MS patients.