

DIETARY SUPPLEMENTS IN MULTIPLE SCLEROSIS

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SUMMARY – Replacement therapy is a treatment that is not based on accepted medical knowledge and science that is not in accordance with current medical doctrine.

Additional treatment is not contrary to the accepted doctrine of medical schools, but serves only as a supplement to the accepted treatment. Most general practitioners in England and Germany do not contradict these forms of treatment. On average 2/3 of patients with MS in the course of the disease try alternate options and additional treatment.

Alternate forms of treatment that are most commonly used are: diet, homeopathy, chiropractic procedures and methods of relaxation

Detrimental effects of alternative and complementary treatments for patients with MS is not known, but we must avoid the use of active substances entering the body and blood of patients, because in that way we can start a modified immune response. Used are acupuncture, and particularly yoga. Cannabis takes special place. Cannabinoids have antioxidant and neuroprotective effect. Oral cannabinoids and marijuana smoking can relieve some symptoms of MS including spasm and pain. The controlled studies did not validate the effect of oral cannabinoids on spasm in MS.

The aim is to give a brief overview of dietary supplements and the effects of certain vitamins, minerals and oil in people with multiple sclerosis.

Replacement therapy is a treatment that is not based on accepted medical knowledge and science that is not in accordance with current medical doctrine.

Additional treatment is not contrary to the accepted doctrine of medical schools, but serves only as a supplement to the accepted treatment. Most general practitioners in England and Germany do not contradict these forms of treatment. On average 2/3 of patients with MS in the course of the disease try alternate options and additional treatment. This treatment is used primarily by groups of older, well-educated patients with higher impairment, in whom the disease lasts longer. Alternate forms of treatment that are most commonly used are: diet, homeopathy, chiropractic procedures and methods of relaxation. Most patients are keen on these forms of treatment on the initiative of friends and acquaintances, mostly in the progressive stage. Most of the patients choose on their own these treatments without the knowledge of physicians, which in most cases result from fear of possible negative attitude of doctors. It is good that

doctors carefully listen to the proposal of patients about “different” treatment that is not harmful. It is recommended that physicians have at least a clear knowledge about other possible forms of treatment. We must be aware that patients typically report a satisfactory transient effect of different methods.

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Echinacea, which is commonly used plant extracts to improve the defense capabilities of the body, is not recommended in patients with MS, although there is no reliable data on the increasing number of episodes.

Also are not recommended any ozone inhalations and transfusion of their own blood as auto transfusion. Possible sensitization may initiate formation of toxic substances that are harmful to the course of disease.

Q10 refreshes the immune system, which is in MS patients impaired.

Almost one fifth of patients during long-term treatment tested efficacy of acupuncture. With acupuncture we influence the pain, difficulties in urination and psychological tension. Studies were conducted on the effect of acupuncture only in small groups of patients, which is insufficient for a reliable assessment of its efficacy.

Thai-chi has been recognized in some countries as an additional method of treatment. This method fosters harmony and inner strength. In China it is recognized as the prevention of this disease. The reports indicated that this method contributes to a safer walking, reduces excessive muscle tension and fatigue, and has an impact on mood and composure.

Yoga was developed in India, and now is taught in accordance with the needs of man. Yoga stretches the muscles and has a special way of breathing. Regular practicing yoga can influence synchronization of internal organs that are associated with the proper operation of the CNS. Reports speak about the beneficial effects of yoga on pain, fatigue, muscle stiffness, mobility of joints and spine, as well as a better mood.

Cannabis

Cannabinoids have antioxidant and neuroprotective effect. Oral cannabinoids and marijuana smoking can relieve some symptoms of MS including spasm and pain. The controlled studies did not validate the effect of oral cannabinoids on spasm in MS.

Use of marijuana can have a variety of side effects such as sedation, difficult driving, and when smoking cancer and respiratory diseases.

From every substance that we use is expected to slow disease progression, reduce the unpleasant symptoms, have no side effects and that is not too expensive.

The use of cannabis is after tobacco smoking and alcohol drinking the most common bad habit. Cannabis is a psychoactive substance that causes a slight change in psychomotor and cognitive activity. Rarely it have the unpleasant effects in the form of anxiety, hallucinations and lewd. It can cause ecstasy - calmness, rapid heartbeat, decreased blood pressure, increased appetite, dry mouth and dizziness. Through surveys conducted in Canada, US and England it was

found that the prevalence of cannabis use in patients with MS is not so small, and that 14-16% of them had used cannabis.

Patients reported reduction of pain that came as a result of impaired activity of CNS and that is both-ered by illness, then to reduce muscle tension, difficulty in urination, stress, improving sleep and mood, and reduce cramps and muscle pain. Some patients have described the improvement of balance, gait and sexual activity. Shivering is not objectively reduced, although the patients reported that they personally feel better. Experiences with cannabis had primarily young men, smokers and patients who are already before the disease for the purpose of entertainment occasionally used cannabis. Objective improvement was not convincing.

In the Netherlands since 2003 is allowed to use cannabis for medical purposes, and doctors can prescribe it. Active substance MGC (medical-grade cannabis) is prescribed primarily to patients with MS, severe brain and spinal cord injuries, difficulties with muscles and bones, cancer, weight loss and pain. The effect was better after inhalation than after taking the pills.

Preparations as Marinol, Sativex Cannador also containing cannabis.

Results of treatment with cannabis are encouraging, although caution is advisable in particular due to brain-blood vessels events.

ALOA VERA has a laxative effect and is useful in patients with constipation.

Indian ginseng (American, Ashwagandha) could theoretically pose a risk in MS and interfere with the effects of immunomodulating and immunosuppressive therapy. It has sedative properties that may aggravate fatigue and enhance the sedative effect of treatment.

ASIAN GINSENG (Chinese, Japanese) according to limited data the plant moderately improves cognitive function and prevent common colds and flu. It was never explored its use in cognitive dysfunction in MS.

SIBERIAN GINSENG (Eleutherococcus senticosus, Eleuthera, Eleuthero) is different from American and Asian ginseng and contains eleutherozide which may have antioxidant, anticarcinogenic and antiagregant effect. It is claimed that is effective for fatigue and many other states but that is not clinically

proven. In fact, Siberian ginseng can cause sedation, which exacerbates fatigue in MS or enhances the effect of sedative drugs.

GINKGO BILOBA generally refers to the extract of Ginkgo biloba, herbal preparation that is obtained from the leaves of ginkgo tree. There are preliminary evidences that ginkgo biloba extract improves cognitive function in MS. There aren't confirmations in clinical studies that the extract of ginkgo biloba is effective in the treatment of exacerbation.

NONI JUICE is made from the fruit of Morinda citrifolia plant. It is recommended as effective in MS, however, no published clinical studies exist on its use in MS.

PADMA 28 is a complex mixture of more than 20 plants that is sometimes recommended for the treatment of MS. There seems it have immunosuppressive and antioxidant effect. New studies are needed to determine the safety and efficacy of these mixtures.

REISHI MUSHROOM, known as "the elixir of life" is a component of traditional Chinese phytotherapy.

SAGE has sedative properties that may aggravate fatigue in MS or enhance sedative effects of the treatment.

NETTLE has a beneficial effect in urinary tract infections.

CHAMOMILE and **CELERY** have sedative properties that may help patients with MS.

CRANBERRY is probably effective in preventing urinary tract infections. Two chemical ingredient, proanthocyanidin and fructose, can lower adherence of bacteria in urinary tract epithelial cells. Fructose also has antibacterial properties. However, for the treatment of urinary tract infection should not be used because we have effective antibiotics as well as the complications that can arise with untreated urinary tract infections, especially in patients with MS.

SASSAFRAS (a type of laurel) is recommended for infections and urinary tract disorders.

BELLADONA some patients like to take and have good effect as a calming agent.

SENA has laxative properties and is effective in treating constipation.

VALERIANA (*Valeriana officinalis*) may be effective in treating insomnia. Sometimes recommended for treatment of depression, anxiety and spasms. It is usually well tolerated.

BEE PRODUCTS

BEE POLLEN – there is no data on its efficacy in MS. Rarely can cause severe reactions in people with pollen allergy, over sensitivity to the sting of a bee and a person with an allergy to honey.

PROPOLIS and other bee products are sometimes recommended for the treatment of MS, but there is no published studies on their use in MS. May have mild antibacterial and antiviral effect.

ROYAL JELLY is the milk secret by the pharyngeal glands of the young honey bees and is used for feeding the queen. It is sometimes recommended as an effective therapy in MS, but no data support it. But in people with asthma or allergies may cause allergic symptoms, including pruritus, urticaria, eczema, conjunctivitis, rhinorrhea, dyspnea, face and eyelids swelling and asthma.

FATTY ACID

Polyunsaturated fatty acids (PFA) that were tested as supplements in MS include omega-3 and omega-6 polyunsaturated fatty acids. Omega-6 fatty acids include linoleic and gamma-linolenic acid. There are a lot of data that PFA may have therapeutic effect in MS. Many studies on PFA, especially omega-3, showed immunomodulatory effects, including decreased lymphocyte proliferation and reduced production of proinflammatory cytokines in lymphocytes.

More uncontrolled studies on PFA reported the clinical improvement of MS. In five controlled trials of the use PFA in patients with relapsing-remitting MS has not shown the safety and tolerability of the application. Despite the lack of definitive data people with MS will sometimes consider the use of PFA as a reasonable attempt.

OILS

Black currant seed oil, borage seed oil, primrose oil, flaxseed oil, safflower seed, sunflower seed oil containing omega-6 polyunsaturated fatty acids. Flaxseed oil contains especially omega-3 polyunsatu-

rated fatty acids. Using oil in some people reduced the number of relapses and reportedly slowed down the progression. Specified oils have moderate immunosuppressive effect.

If polyunsaturated fatty acids are regularly added to the diet also should be taken vitamin E.

OIL FROM COD LIVER and **FISH OIL** contain omega -3 polyunsaturated fatty acids. These acids are found in fish oil and fatty fish such as salmon, mackerel, sardines, herring, and tuna. Omega 3 fatty acids are also recommended for patients and apparently acting on immune process.

CAFFEINE AND PRODUCTS CONTAINING IT

CAFFEINE is available in tablets and is contained in the coffee, tea, Coca-Cola, guarana. It is effective in improving alertness and intellectual agility, and by the statements of some MS patients reduce fatigue.

COFFEE contains caffeine. The content of caffeine in a cup of coffee is 100-150mg for filtered coffee, 85-100mg for instant coffee and 8mg for decaffeinated coffee. Caffeine is effective in reinforcing vigilance, and in some patients with MS on reducing fatigue. There are no studies on the effects of caffeine or coffee on fatigue, cognitive dysfunction or other symptoms of MS. A reasonable dose (2-3 cups of coffee or 250-300 mg of caffeine per day) is usually well tolerated. But caffeine diuretic and urinary tract irritation can exacerbate bladder problems associated with MS and use of caffeine increases the risk of osteoporosis.

COLA NUT has a similar effect as coffee.

GUARANA, MATE, GREEN TEA contains caffeine and has similar effects as coffee.

VITAMINS

VITAMIN D

Even before 30 years were published data on the role of vitamin D in patients with multiple sclerosis. In recent years interest in the role of vitamin D was increased and epidemiological studies have shown higher risk of developing multiple sclerosis in patients with reduced levels of vitamin D.

The primary form of vitamin D (vitamin D₃) is created from two sources: skin exposure to sunlight and ultraviolet B rays and through the diet. Vitamin

D₃ is found in certain foods - milk, orange juice, cheeses, cereals, blue fish (salmon and tuna). It should be noted that most of the vitamin D is obtained by ultraviolet B rays during sun tanning.

Vitamin D acts on the regulation of calcium and also has an important effect on brain function and differentiation of immune cells and modulatory effect of the immune process. As is well known from epidemiological studies, vulnerability to multiple sclerosis is lower in regions with a high percentage of sunny days.

In many patients with multiple sclerosis, demonstrated are decreased levels of vitamin D. Studies have also shown that in patients with exacerbation of the disease, the level of vitamin D was reduced relative to the stable phase of the disease. Some have even found that the deterioration in patients was associated with the months when the level of vitamin D was the lowest. It also describes the effect of vitamin D on cognitive abilities. Based on this more is manifested the role of vitamin D in the prevention of diseases such as multiple sclerosis. There are strong indications that vitamin D in early adolescence and early adulthood has a strong influence on the possibility of diseases such as multiple sclerosis.

Vitamin A (axerophthol) belongs to a group of structurally related molecules known as retinoids. Beta-carotene and vitamin A has many biological effects including antioxidant and immune activity.

Vitamin B₁ (thiamin, aneurin) is sometimes recommended for treating fatigue.

Vitamin B₂ (riboflavin), B₃ (niacin), B₆ (pyridoxine) and B₉ (folic acid) do not have clear applications in MS.

Vitamin B₁₂ (cyanocobalamin) is sometimes recommended for MS. The smaller proportion of people with MS may have a lack of vitamin B₁₂, and they may have the benefit. There is no proven data that it is useful to provide vitamin B₁₂ to MS patients who do not have its lack.

Vitamin C (*Acidum ascorbicum*) is sometimes recommended for several reasons. First, patients with MS may to some extent reduce the duration of colds and thus secondarily reduce the risk of worsening of the disease. Vitamin C has the antioxidant properties. There is considerable data indicating that the oxidative damage induced by free radicals increased in patients

with MS and harmful oxidative processes involved in myelin damage and nerve extensions.

Vitamin E (tocopherol) is recommended in the MS due to its antioxidant properties. Vitamin E is important for people who have a diet with unsaturated fatty acids.

Hyperbaric Chamber

There have been attempts of treatment with hyperbaric chamber, where the patient breathes oxygen at high pressure. Beneficial effect was found in a survey treatment of the signs at the artificially induced allergic inflammation of the brain. The effect in patients with MS is questionable - since 1983 seven researches were carried out. None proved reliable effect in patients with MS. Today we have a hyperbaric chamber in Bosnia and Herzegovina. Treatment in a hyperbaric chamber has been successful primarily in the treatment of gas gangrene and extensive burns.

Diet

Among Norwegian fishermen there is less MS than among Norwegian farmers, and the cause most likely lies in the fact that farmers use large amounts of animal fat. It is possible that the fats that are rich in saturated fatty acids reduce the formation of myelin in the brain.

Described are the various types of diets. There are conflicting reports about the effect of linoleic acid (an unsaturated fatty acid) and its products of these acids (prostaglandins), which act preventively on the immune system. Eating foods that are less industrially processed (Evers diet), diet with low fat and altered ratio of omega 3 and omega-6 supplemented with selenium, fish oil, coenzymes Q (Fratzer diet) and reducing diet with unsaturated fatty acids with the addition of limited amounts of vegetable and fish oils (Swank diet) was not associated with reliable improvement of disease.

Some recommend restriction of gluten in the diet (grains).

Smoking is not recommended. There is a moderate relationship between smoking and MS. Influence of organic solvents has not been proven.