

# Selected methods of unconventional medicine and the possibilities of its usage in multiple sclerosis – analysis of the issue based on the PubMed medical database

## Wybrane metody medycyny niekonwencjonalnej oraz możliwości stosowania przez chorych na stwardnienie rozsiane – analiza zagadnienia w oparciu o bazę medyczną Pub Med

Szymon Pasiut<sup>1 (A,B,D,E,F)</sup>, Elżbieta Mirek<sup>1 (B,D,E)</sup>, Magdalena Filip<sup>1 (D,E)</sup>,  
Jadwiga Szymura<sup>1 (D,E)</sup>, Katarzyna Proficz<sup>B,D,E,F</sup>

<sup>1</sup> Faculty of Clinical Rehabilitation, Department of Movement Rehabilitation, University of Physical Education, Krakow

### Key words

multiple sclerosis, treatment, alternative medicine, complementary medicine, rehabilitation

### Summary

**Introduction:** People with multiple or long-term multiple sclerosis often use complementary or alternative medicine (CAM). CAM is considered a controversial field of treatment by both neurologists and specialists in other fields of medicine. Nevertheless, there is growing interest in this type of treatment.

**Aim of the study:** The aim of this study is to review literature related to the most current knowledge regarding the application of alternative medicine methods in patients suffering from multiple sclerosis based on experimental and medical studies.

**Methods:** The method used in the study was to search and analyze the latest articles related to unconventional medicine and multiple sclerosis, available in the PubMed medical database.

**Findings:** The most common methods of CAM usage in MS include: vitamin and mineral supplementation, intake of omega-3 and omega-6, a special diet, acupuncture, herbal medicine, reflexology, yoga and meditation.

**Implications:** Attention has been paid to the problem which is due to high interest in alternatives. Patients with MS often use unconventional in combination with conventional medicine, while remaining under the care of doctors. Patients apply the presented method as complementary therapy, not an alternative.

### Słowa kluczowe

stwardnienie rozsiane, leczenie, medycyna alternatywna, medycyna komplementarna, rehabilitacja

### Streszczenie

**Wstęp:** Osoby chore na stwardnienie rozsiane o przebiegu poważnym lub długotrwałym często korzystają z komplementarnej lub alternatywnej medycyny CAM. CAM jest uważane za kontrowersyjną dziedzinę leczenia zarówno przez neurologów jak i specjalistów innych dziedzin medycyny. Mimo to obserwuje się wzrost zainteresowania tego typu leczeniem.

**Cel pracy:** Celem pracy jest przegląd piśmiennictwa związanego z najnowszą wiedzą dotyczącą zastosowania metod medycyny niekonwencjonalnej u chorujących na stwardnienie rozsiane w oparciu o badania eksperymentalne i medyczne.

**Metoda pracy:** Metodą wykorzystaną w pracy było wyszukiwanie oraz analiza najnowszych artykułów powiązanych z medycyną niekonwencjonalną oraz stwardnieniem rozsianym, dostępnych w bazie medycznej PubMed.

**Wyniki:** Do najczęstszych metod CAM stosowanych w SM zalicza się: suplementację witaminowo-mineralną, przyjmowanie kwasów tłuszczowych omega-3 i omega-6, specjalną dietę, akupunkturę, ziołolecznictwo, refleksologię, jogę i medytację.

The individual division of this paper was as follows: a – research work project; B – data collection; C – statistical analysis; D – data interpretation; E – manuscript compilation; F – publication search

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**Podsumowanie:** Zwrócono uwagę na problem jaki wynika z dużego zainteresowania metodami alternatywnymi. Chorzy na SM często stosują medycynę niekonwencjonalną, łącząc ją z medycyną konwencjonalną i pozostają pod opieką lekarzy. Chorzy stosują przedstawione metody jako terapię komplementarną, a nie alternatywną.

## INTRODUCTION

For years, scientists have been looking for the best treatment methods of diseases. Patients also try to find additional solutions in the fight against a disease. People with multiple or long-term multiple sclerosis often use complementary or alternative medicine (CAM). CAM is considered a controversial field of treatment by both neurologists and specialists in other fields of medicine. Nevertheless, there is growing interest in this type of treatment. CAM is a concept that is difficult to define due to the many existing terms defining this type of treatment and the ways in which it is used. This treatment can be called complementary, alternative, integrative, unconventional or supplementary medicine<sup>1</sup>. A more detailed and complex definition was formulated by NCCAM (The National Center for Complementary and Alternative Medicine). NCCAM is one of the National Institutes of Health (NIH) in the United States appointed to perform research in the field of alternative and complementary medicine. The Institute defined CAM as a diverse group of medical and health treatment systems, therapeutic practices and products that are not part of conventional medicine at the moment<sup>2</sup>. The expression “complementary medicine” means that it is used in conjunction with conventional treatment, while “alternative medicine” indicates that it is used instead of standard treatment<sup>3</sup>. It is also pointed out that alternative medicine is not in itself popular and most people use unconventional methods as a supplement to primary treatment<sup>2,4</sup>.

NCCAM divides CAM into five categories, including<sup>5</sup>:

- **Biologically Based Therapies** are various types of products sold as dietary supplements. These include herbs, vitamins, minerals, probiotics, which are usually common and easily available. In ad-

dition, this group also includes aloe vera and bee venom therapy (apitherapy).

- **Manipulative and Body-Based Methods** are interactions that include, among others, massage, chiropractic, osteopathy and reflexology.
- **Mind-Body Therapies** are based on the relationship between emotional, mental, spiritual and behavioural factors, and their influence on the body and health. Examples of these therapies are meditation, prayer, Tai Chi, hypnosis, yoga or biofeedback. Some of these techniques, such as cognitive-behavioural therapy and support groups once considered as CAM, are now offered as conventional treatments.
- **Energy Therapies** are based on using the energy field of the body such as Reiki, Qi Gong or therapeutic touch, or they use bioelectromagnetic fields such as magnetotherapy or phototherapy.
- **Alternative Medical Systems** are based on a system of complementary theories and practices. Mainly, these are practices that were developed before conventional medicine. These include eastern Chinese medicine, Ayurveda, as well as homeopathy.

NCCAM, based on the research of Dr. Dawid Eisenberg from 1997, states that, on average, 40% of the American population reaches for unconventional medicine in special cases or in general to improve their well-being<sup>2</sup>. Dr. Eisenberg also stated that people more often seek advice from people practicing unconventional medicine than from a doctor, and that almost half of them use CAM without the advice of a doctor or a person using a given therapy<sup>1</sup>.

In 2007, research was conducted in the USA on the most commonly used unconventional methods among the general population of adults. First place was occupied by natural products, the second deep breathing, the

third meditation. Then, successively chiropractic and osteopathy, massage, yoga, diet and relaxation<sup>6</sup>. Also, in the article by Skovgaard, broad dissemination of complementary therapies in Denmark and in other Scandinavian countries was indicated<sup>7</sup>.

The Multiple Sclerosis Society in England estimates that 50-75% of people with MS use complementary or alternative methods during their lifetime<sup>8</sup>.

## STUDY AIM

The aim of the work is a review of literature related to the most current knowledge on the use of alternative medicine methods in patients with multiple sclerosis based on experimental and medical research. The method used in the work regarded searching the PubMed medical database for the latest articles related to unconventional medicine. We introduced English-language terms on multiple sclerosis into the database, such as: *complementary medicine, neurology, alternative medicine, biologically based therapies, alternative medical systems, multiple sclerosis therapy review, complementary and alternative medicine*. Selection criteria of the articles were based on the significance of the presented research and the date of publication.

## UNCONVENTIONAL MEDICINE METHODS USED BY MS PATIENTS

The most common CAM methods used in MS include: vitamin and mineral supplementation, omega-3 and omega-6 fatty acid intake, special diets, acupuncture, herbal medicine, reflexology, yoga and meditation. In addition to these most popular methods, others are also used, such as different types of massage, homeopathy, craniosacral therapy, removal of amalgam fillings, Qigong, as well as

Tai Chi, hypnosis, cannabis, colono-therapy or alternative psychotherapies<sup>1,7,9,10</sup>.

In Poland, the most popular methods of unconventional medicine in SM include: herbal medicine, and in particular, evening primrose oil (56% of subjects), followed by vitamin supplementation (49%) and massage (34%)<sup>11</sup>.

The most common effects of CAM are: improvement of well-being and mobility, pain reduction, spasticity, sensory disturbances and improvement of sphincter function<sup>11</sup>. However, there is not much evidence that would confirm the effectiveness of CAM. In some patients among whom the assumptions of complementary medicine were applied, clinical trials assessing the effect of therapy on disease symptoms were performed. In the guidebook of The National Institute for Health and Clinical Excellence (NICE), some methods such as reflexology, massage, Tai Chi, magnetotherapy, fish oil and a combination of complementary therapies are described as potentially helpful for people with MS in terms of their general well-being, however, these studies must be continued so that they can provide clear results<sup>8</sup>.

Examples of unconventional medicine methods most often used by patients in Poland in the case of MS include:

#### **Supplementation with polyunsaturated fatty acids PUFAs**

Polyunsaturated fatty acids (omega-3 and omega-6) are transformed in the human body into compounds such as prostaglandins and leukotrienes, which support functioning of the immune and nervous systems, and also oversee inflammatory reactions or hormone functions. Some studies have shown reduced levels of these acids in the blood of patients with SM<sup>1,12</sup>.

In 2007, Harbige and Sharief<sup>13</sup> published an article in which they presented the results of using unsaturated fatty acids among patients with MS on the example of borage oil. After 18 months of treatment, it was found that among patients using low

doses of polyunsaturated fatty acids, a smaller increase in disability was observed compared to the placebo group, while those taking high doses of these acids had a reduced level of disability. It was also emphasized that the use of unsaturated fatty acids is visible after a prolonged period of usage, which can be as extensive as 2 years<sup>13</sup>.

This research was carried out on a small number of participants, but has shown that polyunsaturated fatty acids contained, inter alia, in borage oil are helpful in treating the symptoms of multiple sclerosis<sup>13</sup>. Other supplements containing PUFAs include evening primrose oil, which is the most popular among MS patients in Poland, black currant seed oil, linseed oil, fish oil and also walnut oil<sup>1</sup>.

In an article from 2016, Shinto and co-authors presented the results of a 3-month intervention using omega-3 acids in patients with MS and diagnosed depression. It was demonstrated that the effect of therapy on the Montgomery-Asberg Depression Rating Scale (MADRS) was not significantly different from the results achieved in the control group (placebo)<sup>14</sup>.

#### **Supplementation with vitamin and mineral diet**

Dietary supplements include many different substances. Most often, these are vitamins and minerals that may be lacking in one's daily diet. They are offered in the form of tablets, capsules, powders or liquids. The appropriate level of vitamins and minerals in the body ensures its smooth functioning and prevents many ailments<sup>15,16</sup>. In the case of MS, dietary supplementation is most frequently in the form of vitamin D, B6, B12, antioxidant vitamins and magnesium.

#### **Vitamin D**

Vitamin D plays an important role in maintaining normal bone density, preventing osteoporosis and osteopenia. Researchers suspect that this vitamin may also affect the immune system<sup>1</sup>. Some studies suggest there is a relationship between lev-

els of vitamin D and SM. During relapses, a low level of Vit D was noted while a high level was associated with low disease activity. Therefore, it can be concluded that vitamin D supplementation may be targeted at people with relapsing-remitting MS, however, even patients with progressive forms may notice the benefits of its use<sup>17</sup>.

#### **Vitamin B12**

Vitamin B12 is needed for proper functioning of the nervous system<sup>1</sup>. Some observations regarding the level of vitamin B12 in MS patients suggest its lower concentration compared to the healthy population. Usually, however, this level in patients with MS is normal. Therefore, supplementation is justified only in patients with deficiencies of this vitamin. There is no basis for supplementation in patients with normal vitamin B12 levels<sup>18</sup>.

#### **Magnesium**

Deficiencies of this element are associated with, among others, unpleasant muscle cramps, fatigue, joint pain, tingling in the extremities, dizziness, lack of concentration, mood variability or weakening of the immune system. At the same time, they are symptoms of multiple sclerosis, therefore, magnesium supplementation is often recommended in the course of this disease<sup>19</sup>. There are not many studies confirming the beneficial effect of dietary supplementation with magnesium, but in 2000, Wade and Rossier described the positive effects of magnesium therapy regarding spasticity and range of motion in the knee and hip joints<sup>20</sup>.

In its brochure – "Vitamins, Minerals & Herbs in MS" – the National Multiple Sclerosis Society writes that all dietary supplements should be consulted with a doctor. It also warns against the danger of over-supplementation, while small doses of supplements may be beneficial to the patient, larger doses can be detrimental. It also emphasizes the fact that most supplements are not tested and that the effects of taking them in the case of MS are not completely known. This disease is associated with unexpected appearances and regression of

symptoms, which makes it difficult to say whether these symptoms have anything to do with the intake of dietary supplements or not. Therefore, it is important to apply an adequate intake of vitamins and minerals during the day, which is best achieved via consuming natural products such as fruits and vegetables<sup>18</sup>.

### Massage

Classic massage in the case of multiple sclerosis is still a cause of disputes among specialists dealing with this disease. Some of them exclude this procedure in patients, while others recommend it. The aim of massage in MS is to counteract spasticity by loosening muscles and increasing range of motion, as well as improving circulation in the superficial and deep veins. In patients with severe disabilities, it prevents the formation of pressure ulcers. Massage also relaxes the entire body, reduces stress and fatigue, and has analgesic effects<sup>21,22</sup>.

Studies on the effect of massage on multiple sclerosis are limited and performed among a small number of patients. In 1998, a study by Hernandez-Reif et al.<sup>23</sup> on a small group of patients showed that massage reduces anxiety, improves mood, increases self-esteem and improves appearance. In 2003, Siev-Ner et al.<sup>24</sup> demonstrated the efficacy of reflexology in reducing spasticity, paresthesia and bladder function problems in a group of 53 patients. In 1999, Fladenkrais<sup>25</sup> saw the positive effect in reducing stress and anxiety, but did not notice any improvement in the physical aspect of the patients. On the other hand, Premkumar<sup>26,27</sup> noted the positive effect of aromatherapy massage on improvement in sleep, mobility and overall well-being. In a pilot study published in 2016, Backus<sup>28</sup> pointed to the possibility of the positive effects of massage on fatigue and pain in patients with multiple sclerosis. In the research by Schroeder et al.<sup>29</sup> from 2014, attention was paid, *inter alia*, to the perception of overall health improvement, expressed in the written comments of surveyed patients, as a positive effect of massage therapy in patients with MS.

Apart from the positive aspects of massage, some may also be negative. Patients with MS are sensitive to temperature changes, especially to its increase. Heat is poorly tolerated by patients, thus overheating the body is not recommended. Massage not only increases the temperature of tissues subjected to massage, but also the whole body, therefore, it should be used with caution. In "Massage Today" (2002), Werner<sup>30</sup> recommends discontinuing massage during exacerbation of the disease, and Ben Benjamin<sup>31</sup> (2001) also advises against massage treatments in the subacute state due to the possibility of causing painful and uncontrolled muscle spasms<sup>26</sup>. Furthermore, patients with MS are often exposed to osteoporosis, which is a relative contraindication to massage procedures.

### Cryotherapy

Cryotherapy, also known as "cold treatment", is a procedure that involves lowering the temperature of the skin and subcutaneous tissues in selected areas of the body or in the whole system. Therefore, cryotherapy can be divided into local and systemic or whole-body. In Poland, systemic cryotherapy has been used since 1989, and the doctor qualifies a patient for treatment taking all indications and contraindications of treatment with cold into account for a given patient. The treatment consists of a 2-3 minute cooling down period of the entire body or body area at a temperature between -110 and -160° Celsius. Immediately after each treatment, patients undergo obligatory kinesitherapy. Multiple sclerosis is one of the indications for cryotherapy. Cryotherapy reduces muscle tension by reducing nerve conduction and analgesia by increasing pain threshold, reducing the reactivity of peripheral sensory-nerve endings. It has simultaneous anti-inflammatory and anti-oedematous effects, causing a secondary increase in muscle strength. Systemic treatments additionally provide immunological and hormonal effects, cause improved mood, relaxation and reduction in sleeping disorders<sup>32</sup>.

In her research, Elżbieta Miller dealt with the effects of systemic cryotherapy on oxidative stress in multiple sclerosis. Oxidative stress is a state of imbalance between oxidation processes, which results in the formation of reactive oxygen species (ROS), and antioxidative processes that neutralize them. ROS are formed in the body due to external factors such as UV radiation and during immune defenses. They can contribute to cell and tissue damage or impair their proper functioning, thus leading to neurodegenerative processes<sup>33</sup>. In the research, it was demonstrated that people with MS have lower antioxidant capacity of the body, and hence, a higher concentration of ROS. In the same study, it was proved that general cryotherapy treatments combined with moderate exercise contribute to an increase in the body's antioxidant defense. This research has also shown that treatment with cold not only reduces symptoms of the disease, but also contributes to slower disease progression thanks to the inhibition of neurodegenerative processes<sup>34</sup>. In a different study from 2016, Miller et al.<sup>35</sup> indicate the positive effect of cryostimulation on functional abilities and fatigue symptoms in patients suffering from multiple sclerosis.

Other, more interesting or controversial methods of supplementary treatment of MS include: Cannabis (Marijuana) and the removal of amalgam fillings from the teeth.

### Cannabis (Marijuana)

Treatment with cannabinoids (cannabis) is one of the most controversial methods of MS treatment due to side effects and legal aspects, because in many countries (including Poland), these measures are prohibited. Cannabis can be taken orally or smoked<sup>1</sup>. In research, over 80% of those using marijuana experienced improvements in spasticity, tremors, pain, depression, anxiety and paresthesia. In a study from 2007, cannabis was shown to be effective in treating pain associated with SM<sup>36</sup>. The studies published in 2016 pointed to the most common cause of why patients turn to cannabinoid

therapy. These were: sleep (86%), pain (75%), anxiety (73%) and spasticity (68%)<sup>37</sup>.

In 2008, the London School of Medicine found that medical marijuana can even slow the progression of neurodegeneration. In a study conducted among 400 patients, there was almost twice as much improvement in feeling of stiffness in those using oral cannabis therapy compared to the placebo group. Improvement in pain, muscle cramps and sleep quality were also noted<sup>36</sup>. Urinary tract infections, dizziness, dry mouth and headache have been reported as the most common negative side-effects. Studies have shown that patients who smoked marijuana had worse results compared to non-smokers in cognitive tests and memory-related tasks. In 2011, the results of analysis conducted at the University of Toronto were published, which examined patients with MS 12 hours after the last usage of marijuana. On their basis, it was found that these patients achieve significantly worse results regarding information processing speed, operational memory, executive and other cognitive functions<sup>38</sup>. In addition to the above, marijuana can cause nausea, vomiting, sedation, as well as visual and coordination disorders<sup>1</sup>. Potential addiction to marijuana can also be a dangerous side-effect.

### Removal of amalgam fillings from the teeth

Amalgam fillings include mercury, silver, copper, zinc and tin. It is believed that mercury released from dental seals can cause damage to the immune and nervous systems. Mercury concentrations in the brain tissue of MS patients are higher than in the general population. The existence of the belief that MS may be due to allergic reactions to mercury, therefore causes some people remove amalgam fillings as one of its sources. There is no research on this issue, however, there are reports of MS patients who have benefited from the removal of such fillings from their teeth. Nevertheless, this is not recommended by many organizations for MS treatment.

## CONCLUSIONS

Alternative and complementary methods are considered by many medical specialists as a controversial field of treatment. They often do not include such methods as a complement to basic therapy or even assume a negative position on this matter. Nevertheless, in recent years, there has been an increase in interest concerning such methods. This particularly applies to people suffering from chronic, progressive diseases with which conventional medicine still cannot cope. In the field of neurology, people with multiple sclerosis belong to the group most often using CAM<sup>9</sup>. Loraschi's study from 2016 indicates the use of CAM in 42.5% of patients with SM<sup>39</sup>.

It is not entirely clear why CAM plays such a large role in the era of developing medicine. It seems that patients look to practitioners of alternative methods to achieve time devotion, conversation, touch and optimism which is not so common among physicians<sup>40</sup>. In addition, there is a shared opinion that alternative methods are safe and even if they do not help, they certainly will not hurt. However, this opinion is based more on the beliefs than on actual research carried out assessing the effectiveness of CAM methods<sup>41</sup>. A study by Schwarz et al.<sup>42</sup> among patients complementing conventional methods, shows that more people (44%) note positive treatment effects compared to patients using only conventional medical methods (38%), which gives a significant statistical difference ( $p < 0.05$ ). Eisenberg's 1997 study showed that an average of 40% of the American population reaches for unconventional methods<sup>2</sup>. Other studies show that among people with multiple sclerosis, over 50% of patients use CAM, and sometimes this result reaches even 70%<sup>1,9</sup>. Therefore, people with MS are more likely to use CAM than people from the general population. At the same time, almost all patients with MS using unconventional methods combine it with conventional medicine and remain under the care of physicians, treating CAM as complementary therapy, not an alternative one<sup>1,9,11</sup>.

## Conflict of interest: none

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**Address for correspondence**

Szymon Pasiut PhD  
University of Physical Education, Krakow  
Department of Movement Rehabilitation  
Faculty of Clinical Rehabilitation  
Al. Jana Pawła II 78, 31-571 Kraków, Poland  
mobile. 12 6831380  
e-mail: [szymon.pasiut@gmail.com](mailto:szymon.pasiut@gmail.com)

Multiple sclerosis (MS) is a chronic disease that affects the central nervous system. Learn about the types of MS and how the symptoms can be managed. Symptoms depend on which part of the central nervous system is affected and how much damage has occurred. The most common symptoms are: problems with controlling the body – like muscle spasms, weakness, loss of coordination and balance. tiredness and sensitivity to heat (a hot day or a hot bath, or even a hot cup of tea, can make symptoms worse). other nervous symptom problems – including vertigo, pins and needles, dizziness, neuralgia and problems with eyesight. Key words: multiple sclerosis, comorbidity, methods of acupuncture diagnosis. Discover the world's research. 19+ million members. To the Editor: In the August issue of Stroke, Zhang and colleagues<sup>1</sup> took on the tremendous task to present a systematic review of the efficacy of complex Traditional Chinese Medicine (TCM) for stroke. The authors have included 34 randomized, controlled trials and quasi-randomized, controlled trials, which had assessed the effect of complex TCM on motor dysfunction after a stroke. In a quite [Show full abstract] appropriate way, they have chosen death, activities of daily living, functional recovery, and quality of life as outcome criteria. They correctly stress the poor methodological quality. Methods: We assessed the HRQOL of 215 MS outpatients in our clinic using the MSQOL-54 and Fatigue Severity Scale (FSS), and that of 172 healthy controls, using the SF-36 (a subset of MSQOL-54). We compared QOL between MS subgroups defined by disability, gender and employment, and computed the linear and non-linear relationships between disability level measured by the Expanded Disability Status Scale (EDSS) and MSQOL-54 dimensions. (1996) ArticleTitleValidation of the functional assessment of multiple sclerosis quality of life instrument Neurology 47 129–139 Occurrence Handle1:STN:280:BymB1M7gtlQ%3D Occurrence Handle8710066. Multiple Sclerosis Center, Carmel Medical Center, Technion – Israel Institute of Technology, Haifa, Israel. Multiple Sclerosis Journal is a peer-reviewed international journal that focuses on all aspects of multiple sclerosis, neuromyelitis optica and other related autoimmune diseases of the central nervous system. The journal for your research in the following areas: • Biologic basis: pathology, myelin biology, pathophysiology of the blood/brain barrier, axo-glial pathobiology, remyelination, virology and microbiome, immunology, proteomics, experimental models. The multifocal nature of lesions in multiple sclerosis hints at the occurrence of autobiographical memory (AbM) impairment. However, the dearth of studies on AbM in multiple sclerosis is noticeable, notwithstanding the importance of AbM in everyday life. In the first section of this study, 25 multiple sclerosis patients and 35 controls underwent a detailed episodic AbM assessment. Our objective was to assess the effectiveness of a cognitive facilitation programme designed to alleviate AbM retrieval deficits, based on the key role of mental visual imagery on AbM. Statistical group analyses by means of ANOVA and individual analyses using the  $t(2)$  test showed significant differences in AbM test results, in post-facilitation relative to pre-facilitation training, in all 10 patients.