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Impact of Dietary Intake on the Incidence and Severity of Menopausal Symptoms: A Literature Review

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Abstract— Symptoms of menopause can vary in severity among women. The use of a proper diet and the inclusion of the right nutrients in the food intake, affects the health and well-being of females. The effect of food intake on postmenopausal ailments is now being intensively studied.

The purpose of this study is to systematize knowledge about the impact of diet on the occurrence and severity of menopausal symptoms (MS) and to raise awareness of this issue among the public and healthcare professionals.

This paper is based on a comprehensive review of scientific research conducted worldwide. In the searching process the terms “menopause”, “menopausal symptoms”, “postmenopausal women”, “diet” and “dietary pattern” were used.

Diets based on vegetables, fruits, and whole grains have a positive effect on relieving MS and are associated with less frequent symptoms. Consuming foods with a high content of saturated fats has a negative impact.

Introducing a properly selected diet for women in the postmenopausal period can contribute to improving their quality of life and health. At this point, a plant-based dietary pattern that excludes highly processed foods, rich in sugars and animal products seems most favorable. The results of studies on the effect of taking vitamin or caffeine preparations on MS are uncertain. Therefore, further research is necessary to determine optimal dietary and supplementation guidelines for treating intractable symptoms in postmenopausal women.

Keywords— M**enopause, menopausal symptoms, postmenopausal women, diet, dietary patterns**

1. Introduction

The rising life expectancy, results in an increasing number of women in the postmenopausal period. Menopause is defined as the permanent cessation of the menstrual cycle. It is a physiological process and is associated with the setting of gonadal function. It leads to the inhibition of ovarian synthesis of sex hormones [1]. Estrogens have a very wide range of effects on the organism, so a decrease in their concentration results in changes in the functioning of many systems in the body [2].

Postmenopausal women struggle with a group of symptoms. It can have different courses in individuals. Symptoms caused by menopause are complained of by 75-80% of women. Among the most common and best studied are vasomotor symptoms, psychological symptoms, musculoskeletal and genitourinary disorders, and sleep disturbances [3]. Prevalent in this female population are hot flashes and night sweats, impaired concentration, mood swings, or bone and joint pain [4]. Preventing the discomfort, and aiming to reduce its severity, is of great importance for improving women's quality of life, as well as for clinical reasons [5].

In recent years, there has been increased interest in alternative methods to the most commonly used hormone therapy for dealing with the adverse symptoms of menopause. Among other things, the impact of a healthy lifestyle, diet, and the use of natural herbal remedies on them was observed [7]. The research focused mainly on the correlation between the intake of specific nutrients and the severity of MS. The impact of supplementation with soy products, isoflavones [6], green tea, or aloe [2] on symptoms of the vascular and urinary-genital systems has been described, but the need for further research in this area has also been indicated. In contrast, there are few studies that describe the relationship between food consumption, eating habits, and overall diet and menopausal symptoms in postmenopausal women.

This study discusses and systematizes the latest knowledge on the impact of diet on MS.

2. Materials and Methods

The review was based on the analysis of materials collected in online databases including PubMed, Google Scholar, and Scopus. The following keywords were used to search the literature: “menopausal symptoms”, “menopause”, “postmenopausal women”, “diet”, “dietary intake”, and “dietary pattern”. A total of 267 articles published between 2001 and 2025 were considered for the study and verified for their relevance to the topic of the effects of diet on the severity of MS. This paper was written based on a review of the knowledge contained in scientific studies conducted around the world. The titles, abstracts, and full text of the articles were then independently checked by three researchers. Ultimately, 41 articles were included in the study. Any disagreements were resolved through consensus discussions or, if necessary, with the assistance of a fourth researcher. The types of articles that were analyzed in the study are clinical trial, controlled clinical trial, retrospective cohort study, systematic review, observational study and meta-analysis. We were particularly interested in articles addressing the impact of diet and its nutritional components on the occurrence and severity of menopausal symptoms in postmenopausal women. The exclusion criteria comprised mixed or inaccurate diagnoses, thesis dissertations, duplicate reports, and conference abstracts. As publications related to the mentioned terms were selected. Hand searching the references of the identified studies and reviews was carried out too.

3. State of knowledge

1) Vegetables, fruits, and whole grains - the impact of plant-based diets

Over the years, many studies have been conducted, proving that a healthy diet is essential to reduce the risk of chronic diseases that occur in middle age and later [5]. There are different definitions of healthy dietary patterns, but all of them indicate the need to include wholesome plant-based products in the diet. At the same time, the consumption of meat, simple sugars and refined and processed foods should be limited. Following such a diet can bring many health benefits, such as lowering blood pressure, blood cholesterol levels, and reducing the risk of type 2 diabetes [7]. It has been proven that eating a healthy diet also helps alleviate the symptoms of menopause. In 2019, researchers from the University of Tehran conducted a study on a group of 400 postmenopausal women. The study showed that in the group that followed a dietary pattern based on minimally processed plant foods, there was a lower frequency of menopause-related symptoms, including genitourinary symptoms (decreased libido, urinary problems, and vaginal dryness), somatic symptoms (hot flashes, night sweats, sleep disorders, and muscle and joint pain), and psychological symptoms (anxiety, poor memory, and lack of concentration) [8]. Zhao-Min and colleagues, have carried out a study on the relationship between dietary patterns and the incidence of menopausal symptoms in postmenopausal women in a Chinese population. They described a significantly lower number of MS cases among women who consumed large amounts of vegetables, fruits, and whole grains, compared to groups who followed a diet consisting mainly of highly processed foods and animal products [5]. The results of a study conducted by Australian researchers indicate that a diet low in fat and rich in whole-grain bread and cereal has a positive effect on improving mood and reducing the frequency of mood swings in postmenopausal women [9]. It also markedly reduces the risk of depression, and decreases feelings of stress [10]. On the other hand, researchers have described that the Mediterranean diet, consisting of products such as olive oil, fish, or nuts, does not significantly affect the intensity or reduction of MS [11]. Another study conducted in an Asian population reported a negative correlation between fish, dairy products, and soy products consumption and MS severity [12].

2) Foods containing soy - phytoestrogens and menopause

Soy and soy products have received special attention from researchers. Despite the suspected negative impact on the human body, mainly disruptions in thyroid hormone levels [13], the benefits of consuming soy products appear to be promising. In addition to being a source of plant protein, soy contains isoflavones. These substances belong to the class of non-steroidal phytochemicals called phytoestrogens, which are similar in structure and properties to endogenous estrogens, mainly 17β-estradiol, and have the ability to interact with estrogen receptors [14]. It has been proven that women who regularly consume soy isoflavones are less likely to develop osteoporosis due to a decrease in bone resorption and a higher bone mineral density compared to women who do not consume soy products [15]. The correlation between a diet rich in soy and a reduction in the severity of hot seizures is the most strongly proven. Although they exhibit much weaker and slower action than exogenous estradiol, further research in this area may result in the development of an effective MS therapy based on soy isoflavones [16].

3) The influence of processed foods and those rich in saturated fats and sugars

In recent decades, the consumption of diets based on processed foods, ready-made products, and those containing saturated fats and simple sugars has increased dramatically. This eating pattern has been dubbed the Western-type diet. Consuming such products affects the body, causing weight gain, lipid metabolism disorders, and activation of the immune system [17]. Highly processed foods have a negative impact on the health of women in the postmenopausal period. Soleymani and colleagues demonstrated that a diet containing large amounts of saturated fats, sugars, and meat products contributes to the intensification of physical, psychological, and urogenital symptoms occurring during menopause [8]. A Western-type diet easily leads to overweight and obesity, which is not insignificant in the intensity of MS. It has been described that an increase in BMI (body mass index) and waist circumference are positively correlated with the severity of vasomotor symptoms in early menopause women [18]. Moreover, such a dietary pattern can cause many chronic diseases, the incidence of which increases among women over 40 years of age. An observational study conducted over 19 years in the USA conclusively demonstrated a positive correlation between the consumption of ultra-processed foods and mortality due to cardiovascular and metabolic diseases [19]. Moreover, observations on the Hispanic community additionally indicated a higher mortality rate from any cause, most often due to cancer, compared to the group that followed a healthy diet [20].

4) Would vitamin supplementation play a role in the treatment of menopausal symptoms?

Oxidative stress, caused by reactive oxygen species (ROS), damages cells and leads to chronic inflammation. The human organism is capable of reducing the level of ROS through the antioxidant defense system, and consuming foods rich in antioxidant substances provides important support for these mechanisms [21]. Prominent among these are certain vitamins, which are mainly found in products of plant origin. Inflammatory processes are associated with the occurrence and intensity of MS. In 2015, the strenght of hot flashes was observed in two groups of women with high and low levels of vitamins. This study considered, among others, vitamins A, D, K, and B complex. No significant differences were reported between the two groups, and the authors concluded that supplementation of these compounds should not be recommended to women to alleviate MS [22]. In contrast, Iranian researchers have observed a positive effect of vitamin E supplementation in relieving hot flashes [23]. To the same conclusions came the authors of the study made in 2017. They noted the positive effect of consuming foods rich in B complex vitamins, as well as vitamins E and A, on maintaining a normal sleep cycle and mood disorders in postmenopausal women [24]. It is assumed that an important factor causing hot flashes is the menopausal decrease in serotonin. It is believed that vitamin D has the ability to prevent serotonin levels from dropping. An indirect confirmation of this theory is research comparing the severity of MS in women with normal vitamin D levels and those with a deficiency. Significantly lower MS severity, and a claimed better quality of life in the group of women without vitamin D deficiency have been described [25].

5) Dietary participation of polyunsaturated fatty acids and the risk of postmenopausal diseases

It is well known that estrogens have a positive effect on the cardiovascular system. During the postmenopausal period, as the level of sex hormones decreases, the risk of cardiovascular disease increases due to changes in lipid parameters and stiffening of the walls of blood vessels [26]. Postmenopausal women are five times more likely to develop obesity and metabolic syndrome than women of reproductive age [27]. Activation of the alpha estrogen receptor by estradiol results in the release of vasodilatory substances, nitric oxide, and prostacyclins, and also stimulates the production of angiotensin. These compounds work on the walls of blood vessels, promoting vasodilation, and also have anti-inflammatory effects. A decrease in estrogen levels is associated with a reduction in the protective effect of these unions on the circulatory system [28]. Of great importance in the prevention of cardiovascular disease is the use of a diet with adequate fatty acid content. Long-chain unsaturated fatty acids, particularly omega-3 fatty acids, are precursors of eicosanoids, compounds that mediate inflammation [29]. Long-chain omega-3 polyunsaturated fatty acids affect various neuro-physiological pathways, including those related to serotonin and dopamine. Their action was described as having a similar effect on the body as selective serotonin reuptake inhibitors (SSRIs) [30]. Through this, it seems possible that they reduce the risk of depression and dementia. In a study conducted at the University of Iowa, no beneficial effect of supplementation with acids on the frequency of depression was proven, however, further research is needed on this topic [31]. Some fatty acids participate in bone remodeling, inhibiting resorption. It has been observed that a high content of omega-3 and omega-6 acids in the diet is associated with higher bone mineral density [32]. Fatty acids may have a positive effect on the vasomotor symptoms of menopause, through modulation of the neurotransmitters of the serotonergic system. In a 2011 study, women with MS were given omega-3 acid treatment. During the 8 weeks, the number of women complaining about hot flashes significantly decreased [33]. As a counterpoint, in a USA study, women who supplemented with fatty acids had a reduction in MS comparable to placebo [34]. Cohen and colleagues reached similar conclusions. They subjected women to a three-month follow-up, during which they took unsaturated fatty acids in pill form. No significant differences were noted in the severity of hot flushes or improvement in sleep disturbances [35]. Given the unclear results of the studies conducted so far, the evidence for a positive effect of omega-3 fatty acids on MS reduction seems to be too weak, indicating the need for further research.

6) Health effects of coffee and tea in postmenopausal age

Until recently, coffee consumption was associated with negative health effects. Recent scientific reports suggest that it may be the other way around. Coffee and tea contain many compounds that have anti-inflammatory, antioxidant, and stimulating effects on the body, including caffeine, cafestol, kahweol, and micronutrients such as potassium, magnesium, and niacin [36]. Caffeine, acting as a psychostimulant, reduces the risk of developing Alzheimer's and Parkinson's disease, among others. Chlorogenic acid present in coffee has antibacterial, antiviral, and antifungal properties [37]. In a study conducted on the Libyan population, researchers attempted to determine the factors that influence the frequency and intensity of MS. For the factor of coffee and tea consumption, the result was not conclusive. In the group of subjects who regularly drank coffee or tea, there was a lower incidence of physical, psychological, vascular, and sexual symptoms. What is interesting, the intensity of the same symptoms was lower in women who never drank tea or coffee [38]. In 2016, a group of 4028 women was observed. It has been clearly proven that an increase in caffeine consumption is positively correlated with the occurrence of urinary incontinence, although their quality of life was higher compared to the group with urinary incontinence and no caffeine intake [39]. The effect of caffeine on the brain's neurons is mainly stimulatory, being an inhibitor of adenosine receptors. It causes energy stimulation, increased concentration, alertness, and attention. At the same time, it can cause sleep deprivation by shortening the total time of sleep, prolonging the sleep latency time, and causing disturbances in the duration of individual sleep phases [40]. Consuming coffee and tea is often associated with improved

mood. It has been proven that daily coffee consumption is correlated with a lower risk of depression in both the elderly and the young. Moreover, those who drank 2-3 cups of coffee a day had a 45% lower risk of committing suicide compared to the group that did not consume caffeine [41]. It seems that daily consumption of coffee and tea can be part of a healthy balanced diet, and have a positive effect on some MS.

4. Conclusions

The dynamically changing demographic situation means that there will be an increasing proportion of postmenopausal women in society. It is extremely important to strive to improve their quality of life, also by alleviating the symptoms associated with menopause. Based on studies, it can be deduced that diet has an impact on MS. The use of diets with a high content of vegetables, fruits, and whole grains was associated with a weaker intensity of MS, or with a less frequent occurrence of vasomotor, psychological, and physical symptoms. In addition, women adhering to healthy dietary patterns experienced lower severity of sleep disturbances, and genitourinary disorders. In contrast, consumption of highly processed foods, containing saturated fats, simple sugars and refined grains, has a strong association with the severity of MS in women. Some researchers have described a correlation between high dietary intake of certain vitamins, caffeine, or polyunsaturated fats and lower intensity of somatic, psychological, and urogenital symptoms, but the results of studies on these issues are ambiguous. At present, there is a lack of evidence that taking particular dietary supplements, is indicated in the treatment of intractable MS. Further research is needed on the effect of diet on the severity of symptoms associated with menopause, which in the future may result in the development of effective methods of dealing with MS through lifestyle changes and the use of appropriate dietary patterns.

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