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IS THE LEVEL OF VITAMIN D AN IMPORTANT FACTOR FOR THE PROGRESSION OF CLINICALLY ISOLATED SYNDROME INTO A DEFINITE MULTIPLE SCLEROSIS?

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SUMMARY
Clinically Isolated Syndrome (CIS) represent the first symptom manifestation that lasts longer than 24 hours and may be a feature of multiple sclerosis (MS). Will this first symptom manifestation progress into the definitive form of MS depends on the environmental factors, but also the genetic factors. One of them is the level of vitamin D. The aim is to analyze the level of vitamin D3 in patients with CIS and monitor their progression into definitive MS. We have analyzed a group of 17 CIS patients from the colder climate area, and a group of 7 patients from the area with warmer climate. Level of vitamin D in the serum was determined, along with brain MRI and liquor examination. The patients were followed during the next 2 years in terms of progression into the definite form of MS. In our study there were more female in both groups, and the age was within younger age groups. Majority of respondents from a colder climate had lower level of vitamin D, as compared to a group from a warmer climate. During a 2-year follow-up period, in the definitive form of MS, from the cold climate group progressed 6 (54.5%) of female, all from the group with decreased vitamin D level and none of the patients from second group from a warmer climate area. The decreased level of vitamin D is a possible predisposition factor for the formation of CIS, but also the progression of CIS into the definitive form of MS.

KEYWORDS: Vitamin D, Clinically Isolated Syndrome (CIS), Multiple Sclerosis (MS).

1. INTRODUCTION

Clinically Isolated Syndrome (CIS) is the first manifestation of symptoms that last longer than 24 hours, and which may be a feature of multiple sclerosis (MS). Will this first symptom manifestation progress into the definitive form of multiple sclerosis depends on many genetic but also the environmental factors. One of them is the level of vitamin D in the serum, which is produced in the body under the influence of the sun, but also can be found in fish, eggs, grains, cheese, butter etc.[1,4,5,7,9]

Multiple sclerosis is an autoimmune disease, of white, but also gray brain mass, of unknown cause, with chronic character, with a lower or greater disability in patients which classify it as a neurodegenerative disease. It can affect all parts of the nervous system, and the clinical picture is very different, which created the saying that MS is a disease with 1000 faces. Women are more often affected compared to men in a ratio of 2:1 or 1.8:1, at the most productive age of life (20-40 years), and the range of the disease occurrence is at age from 10 to 60 years. Autoimmune process triggers of CIS and MS are various viral infections such as herpes simplex type 6, Epstein-Barre virus and the zoster virus. The environment also has an impact on the MS, and so the incidence of MS increases as going from the equator to the north, where there are less sunny days during the year, which imply a conclusion that vitamin D3 level has effects on the occurrence of multiple sclerosis. Individuals that are genetically prone to low levels of vitamin D have an increased risk of multiple sclerosis, but also some other autoimmune diseases.[2,3,4,6,8]

Vitamin D is a steroid hormone that regulates a large number of functions in our cells, but also an immune regulator that stimulates the immune system to fight more effectively against infections. According to the results of the studies, the vitamin D not only protects against multiple sclerosis, but also from infections, arthritis, several types of cancer (breast, prostate, ovarian), and also type 1 diabetes. Normal vitamin D concentrations range from 30 to 50 IU. In order to provide this level, adequate nutrition is needed, or the intake of vitamin D into the organism, but also exposure to the sun's rays where available, as this stimulates the formation of vitamin D in the body.[10,11]

The average daily need for vitamin D is 400 IU, and it is produced in our body during exposure to sun rays. Sufficient daily exposure to the sun is for 15-30 minutes, in order to create this amount, although it is important to know that sunscreen creams prevent the formation of vitamin D in the body.[12]

2. GOAL

The aim is to analyze the level of vitamin D3 in patients with CIS and monitor their progression into definitive MS.

3. MATERIAL AND METHODS

In the study, we have analyzed a group of 17 CIS patients from the colder - moderate continental climate area, and a group of 7 patients from the area with warmer - Mediterranean climate. When setting the CIS diagnosis, in addition to the history of illness and clinical examination, level of vitamin D in the serum was determined, along with MRI of the brain, liquor examination. The patients were followed during the next 2 years in terms of symptoms worsening and progression into the definite form of multiple sclerosis.

4. RESULTS

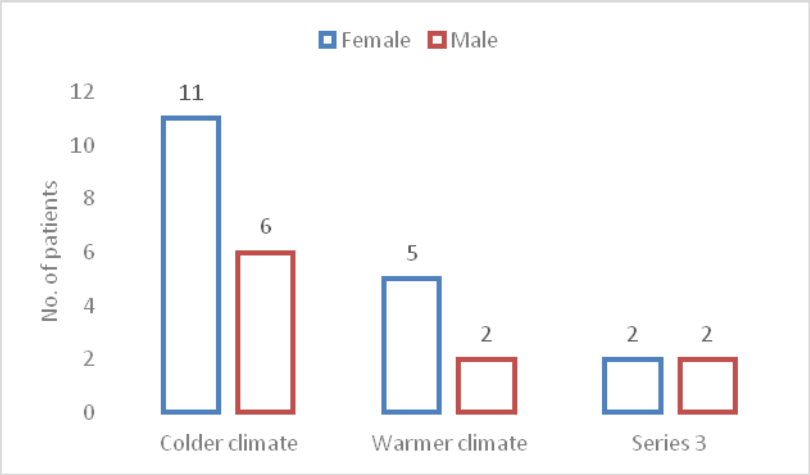

Figure 1: Gender distribution within the observed groups.

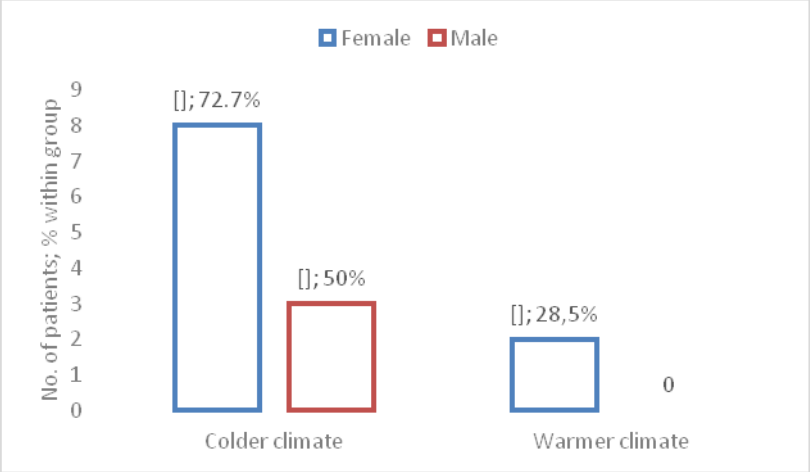

Figure 2: Decreased vitamin D levels according to observed groups.

In the group from colder climate there was 11 females and 6 male patients, at age from 23 to 46 years, while decreased vitamin D levels were observed in 8 (72.7%) female and 3 (50%) male patients. The liquor was positive on oligoclonal strips at 3 (27.2%), and MRI of the brain showed active demyelinating changes in 5 (45.4%) female and 1 (16.6%) male patients. In the group from warmer climate there were 5 females and 2 male patients, at age from 20- 40 years, decreased vitamin D levels was found in only 2 (28.5%) female patients, positive liquor on oligonal strips in 2 (28.5%) female and 1 (14.28%) male patients, and MRI of the brain showed changes in form of active demyelination in 2 (28.5%) female and 14.28% male patients.

During a 2-year follow-up period, in the definitive form of the MS from the cold climate group progressed 6 (54.5%) of women, all from the group with decreased vitamin D levels and none from the groups with warmer climate. Relapses were more frequent and severe in those patients who had lower vitamin D levels.

5. DISCUSSION

Multiple sclerosis is more common in women than men, and in conjunction with this, the CIS itself is more common in women than men, as confirmed by our study. In the colder climate group there were 11 females and 6 male patients, so the ratio of women in comparison to men was 1.8:1, and in the warmer climate group there were 5 females and 2 male patients and the ratio was 2.5:1 in favor of the female sex. the results are in correlation with the studies and results of other authors.[1,9,13] Most often, MS occurs at younger and more productive age, which is confirmed by our study, as the age range when CIS symptoms first occurred ranged from 20 up to 46 years, and later after 2 years of follow-up and progression to definite multiplier sclerosis.[1,14]

Vitamin D is an important factor in immune mediated processes in the body, and as such can play an important role in the pathogenesis of complex immune processes in the emergence of multiple sclerosis, but also other autoimmune processes. It is known that it is synthesized in the skin under the influence of the sunlight, but it also enters the organism through different foods. In this relation, it is already proven that multiple sclerosis, starting from the equator to the north, is more often in terms of incidence and overall prevalence. So, less sun, colder climate, represent greater chance of illness. The vitamin D deficiency therefore presents itself as an important factor in the emergence of various autoimmune and especially demyelinating processes.[13,14]

In our study, the decreased vitamin D level was found in 72.7% and 50% M in the group with a colder, moderate continental climate compared to the group with a warmer, Mediterranean climate, where vitamin D concentrations were found only at 28.5% Ž, and they did not occur in men.

Similar results have been reported by other authors.[15]

A 2-year follow-up period showed a higher number of relapses (from 2 to 4) in patients with decreased vitamin D levels, and the progression to definitive MS was noted in 54.5% of women in the colder group, and no one progressed to the definitive MS from a warmer climate group, who had previous CIS signs. This all points to the fact that the decreased vitamin D level is an essential factor in mediating immune processes at the emergence of definite Multiple Sclerosis.[16,17]

6. CONCLUSION

The decreased level of vitamin D is a possible predisposition factor for the formation of CIS, but also the progression of CIS into the definitive form of MS. The relapses of the disease are also more frequent and more severe in those patients with decreased vitamin D levels.

7. DISCLOSURE

"Conflicts of interest: Nothing to declare".

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