DIAGNOSIS BASED ON VITAMIN D LEVELS IN MENOPAUSAL WOME

[1]Nuftilloyeva Marjona Jabbor qizi

Amanova Madina Furkatovna

[2]Scientific advisor:

[1]Samarkand State Medical University

[2]1st year clinical resident, Department of Obstetrics and Gynecology No. 3

Assistant at the Department of Obstetrics and Gynecology No. 1, Samarkand State Medical University

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Objective: Climacteric syndrome (CS) is a pathological condition characteristic of most women during the period of physiological decline in ovarian function. The most common early symptoms of menopause include vasomotor symptoms, including hot flashes and night sweats, and emotional disturbances (depressive states, sleep disorders, etc.), which are observed in approximately 75% of perimenopausal women and can last for 10 years or more [1-5].

It is currently believed that immune dysregulation, particularly changes in cytokine balance, may play an important role in the pathogenesis of early menopause [6, 7]. Vitamin D metabolism disorders may also be involved in the pathogenesis of KS. Thus, a link between 25(OH)D deficiency and vasomotor symptoms has been identified [8].

Research methods and materials: Inclusion criteria for the study: female gender, postmenopause lasting up to 5 years, written voluntary consent to participate. Exclusion criteria: taking hormonal drugs and immunosuppressants; autoimmune, endocrine diseases, as well as the presence of chronic inflammatory, oncological, hematological and mental diseases, metabolic diseases, chronic kidney and liver diseases.

The first phase of the study assessed clinical signs and symptoms of VD and cytokine profiles in women with CS (n = 229). Control data were the results of a study of women of similar age but without symptoms of CS (control group, n = 73).

In the second phase, the dynamics of clinical and immunological indicators were studied in two groups of women with CS, randomly selected and not differing in age, clinical and laboratory parameters. The first group (comparison group, n = 57) consisted of patients who received therapy with a phytoestrogen preparation for 6 months. The second group (main, n = 57) included women who, in addition to a similar 6-month course of phytoestrogens, were prescribed cholecalciferol using saturation schemes determined by the initial level of 25 (OH) D in the blood serum [13].

Results: There was no significant difference in 25(OH)D levels between CS patients and control participants, but nevertheless, an additional analysis was conducted to assess the frequency of CS detection at different 25(OH)D levels (Table 2). All patients were divided into four groups: normal 25(OH)D content (n = 32; 10.6%), its deficiency (n = 95; 31.5%), moderate (n = 132; 43.7%) and severe (n = 43; 14.2%). The results of multiple comparisons of the results obtained in the four groups did not show significant differences (p = 0.085).

However, when comparing patients in two combined groups with 25(OH)D values of 20.0 ng/mL or more in one group and <20.0 ng/mL in the other (Figure 1), significant differences were found (p = 0.018). Early postmenopausal women with CS symptoms showed increased production of the pro-inflammatory cytokines IL-6 and IL-8 ($p < 0.05$). Patients with 25(OH)D levels less than 20.0 ng/mL were also shown to have a significantly higher incidence of CS, consistent with VD deficiency ($p < 0.05$).

We found that the association between CS and VD deficiency, as well as the decrease in 25(OH)D during CS in the majority of women examined (89.4%), served as the basis for standard correction of this vitamin deficiency. The combination of phytoestrogens and cholecalciferol provided a significant reduction in the severity of clinical manifestations of CS and normalization of IL-8 levels due to a decrease in cytokine production during treatment ($p <0.001$).

Conclusion: Our findings regarding the high frequency of VD deficiency and deficiency in postmenopausal women are consistent with the results of a study by H. Vázquez-Lorente et al. [14]. VD deficiency may be one of the factors in the development of clinical symptoms of CS [15] and normalization of 25 (OH) D levels may help reduce the intensity of the symptoms of the syndrome [16].

To date, there are isolated studies, the conclusions of which confirm the role of changes in the cytokine balance in the development of CS. An increase in the level of some pro-inflammatory cytokines, in particular, TNF-α and IL-8, has been detected in CS [18]. A significant correlation between increased circulating IL-8 concentrations and the presence and severity of hot flashes was shown by A. Malutan et al. [19]. A connection between systemic inflammation and depression as one of the manifestations of CS in peri- and postmenopause has been shown [7, 20]. A significant increase in the level of IL-6 and TNF-α in the serum of perimenopausal women was also found against the background of depression [6].

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