

# СОВРЕМЕННЫЕ МЕТОДЫ ФАРМАКОЛОГИЧЕСКОЙ КОРРЕКЦИИ НАРУШЕНИЙ ФУНКЦИЙ НЕРВНОЙ И ИММУННОЙ СИСТЕМ

<https://doi.org/10.17816/MAJ191S1197-199>

## THE EFFECT OF VITAMIN D ON THE SEVERITY OF DEPRESSION IN PATIENTS WITH RHEUMATOID ARTHRITIS

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## ВЛИЯНИЕ ВИТАМИНА D НА ВЫРАЖЕННОСТЬ ДЕПРЕССИИ У БОЛЬНЫХ РЕВМАТОИДНЫМ АРТРИТОМ

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**Objective:** to study the dependence of depressive disorders in patients with rheumatoid arthritis (RA) on vitamin D deficiency in blood serum. **Material and methods.** 88 women were examined (mean age —  $54.2 \pm 12.0$  years, disease duration — 9.0 [3.5; 16.0] years) with a reliable diagnosis of RA. An enzyme immunoassay was used to determine the 25(OH)D in the serum of patients with RA. Depression was assessed using the Beck scale. **Results.** In 89.8% of patients, an insufficient level of 25(OH)D was detected in the serum. The presence of depression was observed in 66% of patients with RA. A negative correlation of average power ( $r = -0.38$ ) was found between the the level of 25(OH)D and the severity of depression. A negative correlation of average power ( $r = -0.38$ ) was found between the the level of 25(OH)D and the severity of depression. The relationship between 25(OH)D and ESR ( $r = 0.29$ ), depression and intake ( $r = 0.22$ ) and dose ( $r = 0.26$ ) of corticosteroid hormones, the number of painful joints ( $r = 0.25$ ) indicates on the involvement of these predictors and their mutual influence in metabolic and psychological processes in RA. Vitamin D is indirectly involved in inflammatory changes and central sensitization, which provokes psychological disorders in patients with RA. **Conclusion.** Correction of the deficiency of 25(OH)D can positively affect the reduction of the severity of depression and pain in RA.

**Keywords:** rheumatoid arthritis; vitamin D; depression.

**Цель исследования:** изучить зависимость депрессивных расстройств у больных ревматоидным артритом (РА) от недостаточности витамина D в сыворотке крови. **Материалы и методы.** Обследовано 88 женщин (средний возраст —  $54,2 \pm 12,0$  года, длительность заболевания — 9,0 [3,5; 16,0] лет) с достоверным диагнозом РА. Для определения 25(OH)D в сыворотке крови больных РА использовали иммуноферментный метод. Депрессию оценивали с помощью шкалы Бека. **Результаты.** У 89,8 % пациентов в сыворотке крови выявлен недостаточный уровень 25(OH)D. Наличие депрессии отмечено у 66 % больных РА. Обнаружена отрицательная корреляционная связь средней силы ( $r = -0,38$ ) между уровнем 25(OH)D и выраженностью депрессии. Зависимость между 25(OH)D и СОЭ ( $r = 0,29$ ), депрессией и приемом ( $r = 0,22$ ) и дозой ( $r = 0,26$ ) кортикостероидных гормонов, количеством болезненных суставов ( $r = 0,25$ ) свидетельствует о вовлечении данных показателей и их взаимном влиянии в метаболических и психологических процессах при РА. Витамин D опосредовано участвует в воспалительных изменениях и в центральной сенсibilизации, которая провоцирует психологические расстройства у пациентов с РА. **Заключение.** Коррекция дефицита 25(OH)D способно положительно влиять на уменьшение выраженности депрессии и болевого синдрома при РА.

**Ключевые слова:** ревматоидный артрит; витамин D; депрессия.

**Introduction.** In recent years, vitamin D acts as an indicator of general health, since vitamin D deficiency has been established not only with bone tissue metabolism, cardiovascular and autoimmune diseases, but also indicators of mental health. Patients with RA have a high prevalence of depression and anxiety [1, 2], as well as their connection

with a low level of the main serum metabolite of vitamin D — 25(OH)D [3].

**Objective to study** the dependence of depressive disorders in patients with RA on vitamin D deficiency in blood serum.

**Materials and methods.** There were 88 women under observation (mean age —  $54.2 \pm 12.0$  years,

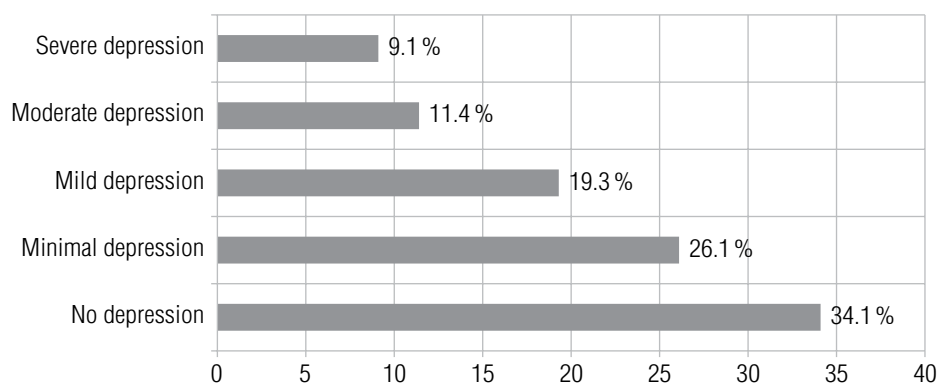


Fig. 1. Depression of patients with RA ( $n = 88$ )

Table 1

The severity of depression in patients with RA and the content of 25(OH)D, nmol/l

Indicators	The severity of depression				
	No depression ( $n = 30$ )	Minimal depression ( $n = 23$ )	Mild depression ( $n = 17$ )	Moderate depression ( $n = 10$ )	Severe depression ( $n = 8$ )
25(OH)D	$58.26 \pm 20.30$	$49.76 \pm 12.18$	$48.73 \pm 15.24$	$43.40 \pm 12.52$	$31.13 \pm 11.39$

disease duration — 9.0 [3.5; 16.0] years) with a reliable diagnosis of RA. To assess the presence of depressive symptoms, Beck's depression questionnaire was used to evaluate the results obtained in points. The level of 25 (OH) D in the serum of RA patients was measured by ELISA using the commercial test system "25-OH-Vitamin D Total" (DRG) and expressed in nmol/l: <25 nmol/l — deficiency, 25–74 — insufficiency, 75–250 — sufficient level.

**Results and discussion.** The results of a psychological study using the Beck scale made it possible to determine the presence of depression in 66% of RA patients (Fig. 1).

The mean value of serum levels of 25(OH)D in patients with RA was  $50.04 \pm 17.49$  nmol/l. The vast majority (89.8%) were patients with insufficient serum 25(OH)D levels. In patients with RA with no signs of depression, the level of 25(OH)D showed maximum values (Table 1) and significantly (Mann-Whitney  $U$  Test) differed from those in groups of patients with moderate ( $p = 0.028$ ) and severe depression ( $p < 0.001$ ); but there were no differences with the groups of patients with mild and moderate depression ( $p > 0.05$ ).

Significant differences in the content of 25(OH)D were also found in patients with minimal and severe ( $p = 0.003$ ), mild and severe ( $p = 0.02$ ) depression. Between the level of 25(OH)D and the severity of depression, the Spearman correlation coefficient was found to have a negative average correlation ( $r = -0.38$ ,  $n = 88$ ,  $p < 0.05$ ). A posi-

tive relationship was found between 25(OH)D and ESR levels ( $r = 0.29$ ,  $n = 73$ ,  $p < 0.05$ ) and blood calcium ( $r = 0.37$ ,  $n = 81$ ,  $p < 0.05$ ). A positive correlation of weak strength was noted between the level of depression and the intake of corticosteroid hormones ( $r = 0.22$ ,  $n = 88$ ,  $p < 0.05$ ) and their dose ( $r = 0.26$ ,  $n = 80$ ,  $p < 0.05$ ), as well as the number of painful joints ( $r = 0.25$ ,  $n = 88$ ,  $p < 0.05$ ) in patients with RA. Vitamin D is probably indirectly involved in joint inflammation and central sensitization, which provokes chronic pain and psychological disorders in patients with RA. Reduced quality of life and the development of depression are associated with low levels of vitamin D in 56.3% of the general population [4]. Vitamin D deficiency is associated with musculoskeletal pain in 83.8% of patients with depression and anxiety, and drug therapy aimed at correction of insufficiency 25(OH)D can significantly improve the physical and mental state of these patients [5]. Adding vitamin D to the main therapy is well tolerated by RA patients and can improve psychological indicators through the regulation of neurotransmitter synthesis, immunomodulation, antioxidant properties, by reducing the severity of depression [6].

**Conclusion.** When conducting an individual assessment and selection of treatment tactics, special attention should be paid to improving metabolic and psychological parameters, since the restoration of the normal level of 25(OH)D can have a positive effect on reducing depression and pain in RA.

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