

your fear. If it is more than six, you need to work on your condition, because it is already capable of harming your health.

**Conclusion.** The proposed technique is simple to implement and quite effective. In addition, there are several quite effective psycho-hygienic methods of dealing with excessive anxiety. But it's necessary keep in mind that any psychological technique is not a magic pill of instant action. All these exercises will be effective only if to repeat them regularly.

DOI 10.36074/24.04.2020.v3.16

## THE VALUE OF SINGLE-NUCLEOTIDE POLYMORPHISM BSMI VDR GENE IN PATIENTS WITH ATOPIC DERMATITIS

---

### RESEARCH GROUP:

**Sergiy Bondar**

Phd, professor, head of the Department of skin and venereal diseases  
*National Pirogov Memorial Medical University*

**Nadia Tokarchuk**

Phd, professor, professor in the Department of Pediatric №1  
*National Pirogov Memorial Medical University*

**Garibeh Ehab**

Aspirant in the Department of skin and venereal disease  
*National Pirogov Memorial Medical University*

**Yulia Vyzhga**

MD, associated professor, Phd, the Department of Pediatric №2, National  
*Pirogov Memorial Medical University*

UKRAINE

---

**Introduction.** Vitamin D deficiency has been receiving a considerable amount of attention in many medical fields, including practical dermatology. The results of studies carried out around the world indicate the “multivector” role of vitamin D in the human body and the various negative effects associated with the lack of its supply [1, 2].

As known, there are a lot of sources that affect the status of vitamin D in humans. The results of the current studies have shown that serum 25 (OH) D levels may also depend on genetic factors. Previous studies have identified several common polymorphic variants of the VDR, GC, NADSYN1 and CYP2R1 genes, which have been associated with circulating levels of 25-hydroxyvitamin D and vitamin D deficiency [3]. At the present juncture, the role of the gene encoding the vitamin D receptor (VDR) is being actively studied [4].

Thus, distinguishing the genetical factors that influence the course of atopic dermatitis is important for understanding the pathophysiological processes of this chronic inflammation.

---

**Objective.** To analyze the scheme of the alleles of single-nucleotide Bsm I polymorphism variants of the VDR gene in patients with atopic dermatitis.

**Materials and methods.** A number of 34 patients with atopic dermatitis were monitored. The diagnosis of AD was established on the basis of criteria that was composed by J.M. Hanifin and G. Rajka. An electrogenerated chemiluminescence (ECL) method was used to determine hydroxyvitamin D circulating in the body using the Elecsys apparatus (Roche Diagnostics, Germany) using cobas test systems. The DNA was extracted from the venous blood of the subjects to be genetically analyzed using the standard phenol-chloroform extraction method. Polymorphic variants of the VDR gene - rs1544410 (Bsm I, A / G transition) were determined with the usage of real-time PCR. Statistical processing of the results was performed by using the vibrational statistics methods using SPSS 17.0. For all types of analysis, differences at  $p < 0.05$  were considered to be statistically significant.

**Results.** The mean age of the patients in the main group was  $28.9 \pm 1.6$  years. Among the observed patients, men were predominated (66.9%). Genotyping of patients with atopic dermatitis by BsmI polymorphism of the VDR gene allowed establishing the frequency with which certain variants of this gene were encountered. According to VDR gene polymorphism studies, patients were divided into three groups. We were able to identify the following genotype distribution of the BsmI polymorphic marker: the first group - carriers of the genotype bb - ( $31 \pm 3, 32\%$ ), the second group - carriers with the genotype Bb - ( $50, 3 \pm 5, 64\%$ ), the third group ( $18, 7 \pm 4, 6\%$ ) with the genotype BB.

It was found that the lowest incidence of homozygotes of B allele was recorded among patients with atopic dermatitis compared to the percentage of heterozygotes and homozygotes of b allele. The differences between the frequencies of these genotypes were statistically significant ( $p < 0.05$ ). Suitably, the frequency of allele B in the cohort of the studied persons was 43.5%, and the frequency of allele b was 56.5%.

In the evaluation of 25 (OH) D concentration in the serum of the surveyed patients, it was found that there is a decrease in the level of it and it was observed in most people (71.1%). Among them, vitamin D deficiency was diagnosed in 32.5% , however, vitamin D deficiency was conformed in 38.8% of patients with atopic dermatitis.

The next stage of the study was to analyze the mean values of serum hydroxyvitamin D relation with the polymorphism of the VDR gene in the subjects. The mean concentration of circulating 25 (OH) D in patients with genotype bb was  $32.38 \pm 3.76$  nmol / l, in carriers of genotype Bb -  $30.17 \pm 3.22$  nmol / l, in patients with genotype BB -  $39.54 \pm 4.98$  nmol / L. Differences when comparing the mean of 25 (OH) D in the serum of the subjects, depending on the BsmI genotypes of the VDR gene polymorphism, were not statistically significant ( $p > 0.05$ ).

In sequence to analyze the possible influence of genetic predisposition on the development of vitamin D deficiency, a comparative characterization of vitamin D status was performed in patients, depending on the distribution of allelic variants of the VDR gene. In accordance with the data obtained, vitamin D sufficiency was more common in heterozygotes (16.6% versus 7.8% in homozygotes of the b allele and 5.23% in homozygotes of the B allele). Among the surveyed patients, vitamin

D deficiency was more common in individuals with the Bb genotype (18.1% versus 7.1% with the BB genotype and 9.6% with the BB genotype). Forasmuch as the highest percentage of vitamin D deficiency was reported in carriers of genotype bb (23.1% versus 12.6% with genotype Bb and 8.8% with genotype BB). Thus, in the study of the incidence of vitamin D deficiency, it was found that the value of this indicator is more likely to be diagnosed in individuals with the genotype bb ( $p < 0.05$ ). The relative risk of developing vitamin D-deficiency in patients with the bb gene VDR (BsmI) genotype compared to carriers of the B allele (BB / Bb) was 1.68 (95% CI: 1.16-2.52,  $p < 0, 05$ ).

The analysis of the data showed that it was precisely the carriers of homozygous b alleles that had a higher incidence of vitamin D deficiency than insufficiency and normal supply. The differences in the frequency of these indicators in this group were statistically significant ( $p < 0.05$ ).

**Conclusions.** In our study, we at first were able to analyze the association of BsmI polymorphism of the VDR gene among patients with atopic dermatitis. The association of the highest frequency of registration of vitamin D deficiency in carriers of genotype bb was disclosed.

#### References:

- [1] Bendik, I. & Friedel, A. (2014) Vitamin D: a critical and essential micronutrient for human health. *Front. Physiol.*, (5), 248. Вилучено з: <https://www.ncbi.nlm.nih.gov/pubmed/25071593>.
- [2] Holick, M.F. & Binkley, N.C. (2011) Evaluation, treatment, and prevention of vitamin D deficiency: An endocrine society clinical practice guideline. *J. Clin. Endocrinol. Metab.*, (96), 1911–1930. Вилучено з: <https://www.ncbi.nlm.nih.gov/pubmed/21646368>.
- [3] Pike, J.W. (2011) Genome-wide principles of gene regulation by the vitamin D receptor and its activating ligand. *Mol Cell Endocrinol.*, (347), 3–10. Вилучено з: <https://www.ncbi.nlm.nih.gov/pubmed/21664239>.
- [4] Zhang, Z.1. & He, J.W. (2013) An analysis of the association between the vitamin D pathway and serum 25-hydroxyvitamin D levels in a healthy Chinese population. *J Bone Miner Res.*, (8), 1784-92. Вилучено з: <https://www.ncbi.nlm.nih.gov/pubmed/23505139>.