

THE LEVEL OF VITAMIN D IN PATIENTS WITH BRONCHIAL ASTHMA DEPENDS ON BODY MASS INDEX AND AGE OF ONSET OF DISEASE

V. V. Kachkovska

Sumy State University, Sumy, Ukraine

Abstract. It is widely known that both obesity and vitamin D deficiency can lead to increased symptoms of bronchial asthma (BA) in both children and adults. Obesity is linked to higher levels of pro-inflammatory mediators and lower levels of vitamin D. In turn, vitamin D deficiency is closely related to obesity and can contribute to increased bronchial hyperreactivity, clinical symptoms of BA, and the development of pulmonary fibrosis.

The study aimed to determine vitamin D levels in patients with BA, considering their body mass index (BMI), age of onset, and clinical and functional characteristics.

Research material and methods. 553 patients with BA were examined. The control group consisted of 95 practically healthy people with no personal or family history of asthma, allergies, or atopy symptoms. All subjects signed a prior informed consent to participate in the study. To determine vitamin D content depending on the BMI, patients were divided into three groups: Group I consisted of 152 patients with normal body weight (NBW), II — 206 overweight patients, III — 195 — with obesity. For the analysis, 2 groups were formed depending on the onset age: 1 group included 271 patients with early onset BA (among them 100 obese patients), 2 — 282 patients with late onset (95 with obesity). The Bioethics Commission of the Educational and Scientific Medical Institute of Sumy State University approved the study. Statistical analysis of the obtained results was carried out using the SPSS-17 program.

The results. A study of vitamin D content in patients with BA ($n = 553$), regardless of the age of onset and BMI, showed a probable decrease in its level (31.9 ± 0.62) compared to practically healthy individuals (43.1 ± 1.04) ng/ml ($p = 0.001$), which indicates its insufficient level.

Given that obesity is associated with vitamin D deficiency, we examined its content depending on BMI. A decrease in the content of vitamin D in patients with BA with NBW and overweight was established to (35.1 ± 1.25) ng/ml and (35.9 ± 0.96) ng/ml, and in patients with BA with obesity to (25.1 ± 0.83) ng/ml, which indicates a connection between BMI and the level of vitamin D. Along with this, it was established that the level of vitamin D was probably lower in patients with early-onset BA — (27.1 ± 0.86) ng/ml compared with those in patients with late BA — (36.4 ± 0.78) ng/ml ($p = 0.001$), with a severe course — (24.7 ± 0.71) ng/ml compared with mild — (39.8 ± 0.78) ng/ml; with a duration of more than 20 years — (26.6 ± 1.20) ng/ml compared to less — (37.7 ± 1.15) ng/ml, with no control — (25.2 ± 0.80) ng/ml compared to complete — (42.4 ± 0.91) ng/ml.

Conclusions. The study found that patients with BA had lower levels of vitamin D compared to the control group. Additionally, among BA patients, those with obesity had lower vitamin D levels compared to those with normal body weight and overweight. The study also established that vitamin D levels were lower in patients with early onset BA compared to those with late onset, and in patients with a disease duration of more than 20 years compared to those with a duration of less than 20 years. Finally, the study found that vitamin D levels were lower in BA patients with no control compared to those who had complete control over their BA.

Key words: bronchial asthma, obesity, vitamin D, course, control.