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PREVALENCE OF VITAMIN D DEFICIENCY AND INSUFFICIENCY IN PATIENTS WITH OBESITY AND DIABETES MELLITUS TYPE 2

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Relevance. Vitamin D deficiency and insufficiency is a worldwide health problem that affects the immense number of children and adults every year. The impact of vitamin D deficiency cannot be underestimated. There is a connection between vitamin D deficiency and a wide range of acute and chronic illnesses, including preeclampsia, dental caries, gum disease, autoimmune disorders, infectious diseases, heart disease, cancers, type 2 diabetes, and neurological disorders.

Vitamin D deficiency is correlated with impaired insulin release and the development of insulin resistance, facilitating the pathogenesis of type 2 diabetes. Some studies have shown that 1α,25-dihydroxyvitamin D3 (1,25(OH)2D3) enhances insulin secretion from pancreatic β-cells, suggesting a direct role of vitamin D in metabolic regulation. Furthermore, the association between vitamin D deficiency and insulin resistance may be mediated by inflammatory pathways, as elevated inflammatory markers have been observed in individuals with low vitamin D levels, while genetic polymorphisms in vitamin D-related genes may also predispose individuals to dysregulated glucose metabolism and increased risk of metabolic syndrome and type 2 diabetes.

Aim: to assess the prevalence of vitamin D insufficiency/deficiency in individuals with obesity and diabetes mellitus type 2.

Materials and methods. The study involved 32 patients: group 1 - 46,9% (n=15) with obesity and group 2 - 53,1% (n=17) with DM type 2. The average age in this groups were 65 (50; 77) and 68 (63; 71) respectively, ($p>0.05$). The data were subjected to analysis using the 4D client software provided by the State Healthcare Institution «Grodno City Polyclinic No. 6». The following parameters were examined: creatinine, triglycerides (TG), cholesterol (CH), glycated hemoglobin (HbA1c), blood pressure (BP), body mass index (BMI), and vitamin D level (25(OH)D). Statistical analyses were conducted using the "STATISTICA 10.0" software.

Results and their discussion. Among participants in group 1 BMI were 34,2 (32,8; 35,2) kg/m^2 which is higher if compared to group 2 - 30,1 (28,8; 31,2) kg/m², $p=0,01$.

The level of 25(OH)D in the blood plasma of patients in group 1 was 14.2 (10.0; 18.8) ng/ml with vitamin D insufficiency in 20% (n=3) and deficiency in 80% (n=12) of patients with obesity. While in group 2, the level of 25(OH)D was 14,3 (11,8; 20,3) ng/ml, with vitamin D insufficiency in 29,4% (n=5) and deficiency in 70,6% (n=12) of patients. The level of 25(OH)D was not found to be within the normal range in the blood plasma of patients from either group. There were no significant differences observed in 25(OH)D levels among the participants, nor was there a notable difference in the ratio of vitamin D deficiency to insufficiency ($p>0.05$).

We found a negative relationship between 25(OH)D levels and HbA1c ($R=-0,50$, $p=0,04$) in group 2, as well as a positive relationship between HbA1c levels and TG ($R=0,61$, $p=0,01$), TC ($R=0,53$, $p=0,03$) and glucose levels ($R=0,55$, $p=0.02$). The analyzed groups of patients had not differences in age, BP, creatinine, CH, or TG ($p>0,05$).

Conclusion. The study revealed a significant prevalence of vitamin D insufficiency and deficiency among patients with obesity and DM type 2. Furthermore, we were not able to find any patients with a level of 25(OH)D within the normal range. These results indicate that it is possible to enhance glycemic management and regulate the metabolic syndrome through the normalization and correction of vitamin D levels in patients.