This study showed a significant inverse relationship between DPID and BMD among Kazakh adolescents. Study demonstrated lower bone density in adolescents who had a higher level of DPID.

***Key words:*** *BMD, bone metabolism, adolescents*

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# FEATURES OF BONE REMODELING IN TYPE 2 DIABETES, COMBINED WITH OSTEOARTHRITIS

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Comorbidity as the coexistence of two or more diseases in one patient, pathogenetically and genetically interconnected - is a fairly common phenomenon in the general population. Combination of diabetes mellitus type 2 with osteoarthritis causes formation of certain pathogenetic mechanisms that can provoke development of osteodeficiency. Given metabolic disorders in diabetes, involvement of the musculoskeletal system in the pathological process, presence of other potential factors associated with osteodeficiency, bone tissue can be considered as a target organ for type 2 diabetes. There is evidence that in patients with osteoarthritis over the age of 50 years, about five diseases are simultaneously diagnosed. So, according to the results of the study conducted in 2005 by R. Caporali and co-authors, 52% of patients with osteoarthritis had hypertension, 21% - osteoporosis, 15% - diabetes mellitus type 2, 12% - chronic obstructive pulmonary disease, 9% - coronary artery disease, 6% - peptic ulcer [1]. Based on this, osteoporosis in patients with comorbid pathology may be a complication of a combined course of illness, or vice versa, will cause a tandem of certain nosologies. Laboratory diagnostics of bone metabolism disorders is preferred method for identifying pathologies at an early stage. Bone remodeling is determined by two main processes - bone formation and resorption, the activity of which is normally equal. Osteodeficiency as insufficient bone formation or excessive bone resorption may be evaluated with markers of bone remodeling. The aim was to study the features of bone remodeling in patients with type 2 diabetes mellitus and concomitant osteoarthrosis.

**Materials and Methods**. The study included patients with diabetes mellitus type 2 in combination with osteoarthritis. Diagnostic criteria for osteoarthritis were the criteria of the American Rheumatologic Association (the presence of the first (46,2%) and the second (53,8%) X-ray stage of osteoarthritis, the classification J.H. Kellgren and J.S. Lawrence). Bone homeostasis was assessed by the activity of a marker of bone formation (bone isoenzyme of alkaline phosphatase - BIAF,%) and a marker of bone resorption (TRKF - tartrate-resistant acid phosphatase, U/L) by biochemical method.

**Results.** Comprehensive examination of 39 patients (17 men and 22 women) with type 2 diabetes combined with osteoarthritis was performed. The average age of patients was 52±7.6 years. To obtain normative indicators, a group of practically healthy patients (20 people) of the corresponding age was examined. In order to study the effect of the degree of carbohydrate metabolism compensation on bone remodeling, patients were divided into two subgroups - 25 patients with controlled glycemia (glycosylated hemoglobin index <7%) and 14 patients with uncontrolled glycemia HbA1**C>**7%). A study of the state of bone remodeling revealed its multidirectional changes, which was manifested by a moderate decrease in the activity of bone formation against a background of a significant increase in the activity of bone resorption. In all examined patients, decrease in the activity of the bone fraction of alkaline phosphatase by

34.5% was detected compared with the same indicator in the control group of patients (55.22±4.83% and 84.31±4.45%, respectively). The intensity of bone resorptive processes in patients with this comorbid pathology was in 1.9 times higher compared to the same indicator in practically healthy patients (the values of TRKF were 1.84±0.46 and 0.97±0.12 U/L, respectively). In case of uncontrolled hyperglycemia, the values of BIAF were significantly lower in comparison with the same indicator in a subgroup of patients with compensated type 2 diabetes combined with osteoarthritis (P<0.05). The values of the indicator of bone resorption in the subgroups of patients with combined pathology did not differ.

Comparing the intensity of the two main processes of bone metabolism in patients with type 2 diabetes combined with osteoarthritis, it can be concluded that there is a negative balance of bone homeostasis. Normally, the intensity of these two processes in adults is balanced, and their disconnection leads to the development of osteodeficiency.

In patients with type 2 diabetes in combination with osteoarthritis, there is a violation of bone remodeling - bone deficiency due to a moderate slowdown in the formation of new bone tissue and an increase in bone resorption activity. The activity of the process of bone formation is affected by the level of glycemia, the maximum inhibition of bone formation occurs at decompensated carbohydrate metabolism. The revealed changes in bone metabolism result in insufficient mineralization of the bone matrix and a violation of bone microarchitectonics, which explains the mechanism of formation of secondary systemic osteoporosis in this category of patients.

Prospects for further research **-** the study of the structural-functional state of bone tissue, as well as the evaluation of the probability of osteoporotic fractures in these patients.

## References.

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***Key words:*** *bone formation, bone resorption, diabetes mellitus type 2, osteoarthritis.*

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# RELEVANCE OF APPLICATION OF THE ELISA METHOD IN RESPIRATORY CHLAMIDIOSIS

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In school-age children with chronic and recurrent lung diseases, respiratory chlamydia is poorly diagnosed, despite its widespread prevalence [1]. The high affinity for the epithelial membrane of the respiratory tract makes Chlamydia pneumoniae one of the commonest etiological agent of respiratory tract infections [2, 4].

For laboratory diagnosis of Chl. Pneumoniae morphological, cultural, immunological, and also molecular biological methods can be used. Immunological methods are the most widely used [1, 3]. In molecular diagnostics, serotyping is important, that is the identification of specific IgM and IgG antibodies to Chl. pneumoniae. The most commonly used is enzyme-linked immunosorbent assay (ELISA).

**Materials and Methods.** Determination of the frequency of occurrence of specific immunoglobulins M and G to chlamydia by the method of ELISA in blood serum in children who were admitted to the hospital from 2017 to the first half of 2019 in the