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ASSOCIATION BETWEEN DIABETES AND BONE MINERAL DENSITY IN PATIENTS WITH HIP FRACTURES

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Objective: Although diabetes mellitus increases fracture risk, bone mineral density (BMD) in patients with diabetes has been reported to be preserved or even increased, and the relationship between the two remains unclear.

Methods: We conducted an observational study of patients admitted with hip fractures between November 2024 and October 2025. Diabetes was defined as the use of antidiabetic medications or an HbA1c level $\geq 6.5\%$. Patients were classified into diabetes and non-diabetes groups. Lumbar spine and femoral neck BMD were measured by dual-energy X-ray absorptiometry. Multivariable linear regression analyses were performed adjusting for age, sex, body mass index (BMI), steroid use, use of osteoporosis medications, use of anticonvulsants, and estimated glomerular filtration rate (eGFR). Additional analyses were conducted among patients with diabetes to evaluate the association between HbA1c and BMD.

Result: The study included 75 patients with diabetes (mean age 86 years) and 171 patients without diabetes (mean age 85 years); 63 women in the diabetes group and 131 women in the non-diabetes group. Lumbar spine BMD was higher in patients with diabetes than in those without diabetes (0.82 ± 0.069 vs. 0.74 ± 0.20 g/cm²), while femoral neck BMD was 0.46 ± 0.038 and 0.43 ± 0.066 g/cm², respectively. Multivariable analysis showed that diabetes was significantly associated with higher lumbar spine BMD ($\beta = 0.058$, $p = 0.013$), but not with femoral neck BMD ($\beta = 0.017$, $p = 0.19$). Among patients with diabetes, HbA1c was not associated with lumbar spine BMD ($\beta = -0.01$, $p = 0.64$), whereas higher HbA1c was significantly associated with lower femoral neck BMD ($\beta = -0.03$, $p = 0.048$).

Conclusions: In patients with hip fractures, diabetes was associated with higher lumbar spine BMD but not with femoral neck BMD. In contrast, in analyses restricted to patients with diabetes, HbA1c showed a negative association with femoral neck BMD, suggesting that the effects of diabetes and glycemic control on bone mineral density may differ by skeletal site.

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BONE TISSUE STATUS IN ADOLESCENTS DEPENDING ON GROWTH INTENSITY AND BSML POLYMORPHISM OF THE VDR GENE

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Objective: To determine the characteristics of the bone tissue condition of adolescents based on the study of densitometry indicators, BSML polymorphism of the VDR gene, and growth intensity.

Materials and methods: 292 children aged 10-17 years were examined. They were divided into two groups depending on gender: 159 boys and

133 girls. Criteria of inclusion: absence of chronic somatic and endocrine pathology, genetic diseases. Adolescent presented to University Pediatric Clinic for general clinical examination, ultrasound densitometry (QUS) (Sonost-2000, Korea) and dual-energy X-ray absorptiometry (DXA) (HOLOGIC QDR W Explorer, USA) were performed according to indications, molecular diagnostics - BSML polymorphism of the VDR gene. The criterion for reducing bone mineral density according to the recommendations of The International Society For Clinical Densitometry, 2019, was considered to be BMD Z-score ≤ -2 .

Results: Low bone mineral density was diagnosed in 66 boys (41.5%) and 52 girls (39.1%) according to the results of QUS and confirmed by DXA. The average Z-score in boys was -2.28 ± 0.302 , in girls -2.41 ± 0.291 . In children with a growth spurt, a decrease in BMD was diagnosed in 50.3% of boys and 60.2% of girls, which is significantly higher than the average indicators for the groups. Pathological mutations (heterozygous and homozygous) of the BSML polymorphism of the VDR gene were detected in 47.2% of boys and 57.1% of girls. In children with a growth spurt, pathological mutations (heterozygous and homozygous) of the BSML polymorphism of the VDR gene were found in 47.8% of boys and 58.3% of girls, which does not significantly differ from the general group of children.

Conclusion: Decreased of bone mineral density was shown in 41.5% of the examined boys and 39.1% of the girls, while in girls in the group with a growth spurt, low bone mineral density was detected more often (60.2%) than in boys (50.3%). Also, pathological mutations of the BSML polymorphism of the VDR gene dominate in the examined children, which lead to a violation of mineral metabolism and requires preventive measures to maintain the health of the bone tissue. But at the same time, during the period of intensive growth, pathological mutations of the BSML polymorphism of the VDR gene did not affect the level of bone mineralization and the percentage of children with low BMD did not become significantly higher, which affects other mechanisms of the formation of a transient decrease in BMD during the growth spurt.

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SECONDARY HYPERPARATHYROIDISM AND BONE HEALTH (BMD AND TBS)): BUSHEHR ELDERLY HEALTH PROGRAM

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Objective: Although the adverse skeletal effects of prolonged, untreated primary hyperparathyroidism (PHPT) are well established, data on the impact of secondary hyperparathyroidism (SHPT) on skeletal health in the general population remain limited. This study investigated the

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