

MUSCLE STRENGTH REDUCTION IN PATIENTS WITH COMBINED COURSE OF DIABETES MELLITUS AND OSTEOPOROSIS

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Objective: Objective: Among patients with diabetes mellitus (DM), the prevalence of osteoporosis (OP) reaches almost 35%, which increases the risk of complications and impairs the quality of life. Modern ideas about the mechanism of development of this comorbidity are the influence of prolonged hyperglycemia and insulin resistance on the function and quantity of osteoblasts, vitamin D metabolism and accumulation of AGE-products that are embedded in the bone matrix and thus damage it. At the same time, patients with a combined course of DM and OP, have normal values of BMD index. Therefore, predicting the development of low-traumatic fractures for this category of patients remains an important problem and requires finding new and sensitive markers.

The purpose of the study was to observe the lower limbs muscular strength and to determine the prognostic importance of its decrease in patients with combined course of DM and OP.

Methods: 45 postmenopausal women with type 2 diabetes were examined, among them 25 had concomitant OP (main group). The remaining patients were included in the control group (20 people). The average age of the main group was 66 ± 2.8 y, the duration of diabetes was 6.8 ± 1.2 y. By age and duration of disease the groups under comparison were statistically equipotent. The lower limbs muscular strength was measured by a dynamometer; glucose level, HbA1c and insulin resistance index (HOMA-IR) by standard biochemical techniques; BMI by the ratio of weight to twice the height; BMD was measured according to the results of X-ray densitometry; 10-y risk of low-traumatic fractures by FRAX scale. The statistical analysis included the determination of the Mann-Whitney criterion and Spearman rank correlation.

Results: The lower limbs muscle strength of patients in the main group was significantly lower than of the control one, and was 55.6 ± 15.4 kg ($p \leq 0.05$). Glucose and HbA1c did not show a statistical difference between the groups, but the HOMA-IR was significantly higher in the group of patients with OP and was 2.4 ± 0.6 ($p \leq 0.05$). Patients of the main group showed a decrease in BMD, which had a trend pattern ($p = 0.059$). There was no significant difference among the two groups under the survey in terms of the 10-y risk of low-traumatic fractures. At the same time, patients in the main group had a moderate negative correlation between the lower limbs muscle strength and the HOMA-IR ($r = -0.6$, $p = 0.04$).

Conclusion: Osteoporosis and high insulin resistance are likely to reduce the postmenopausal women lower limbs muscle strength, which should be taken into account when creating personalized prevention and treatment programs for this category of patients.