

## THE USE OF DENSITOMETRY IN ASSESSING THE RISK OF FRACTURES AND LONG-TERM PROGNOSIS IN PATIENTS RECEIVING HEMODIALYSIS TREATMENT

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<https://doi.org/10.5281/zenodo.7882370>

**Relevance of the study:** Chronic kidney disease (CKD) in the terminal stage leads to severe metabolic damage to 22 bones, which is often complicated by osteoporosis and fractures. The possibilities of dual-energy X-ray absorptiometry in assessing the risk of fractures in patients with CKD are still being questioned, and the possibilities of this research method in assessing the prognosis of patients receiving hemodialysis treatment remain poorly understood.

**Objective:** To study the possibilities of modern densitometry in assessing the risk of fractures in patients suffering from end-stage chronic kidney disease, as well as to study the effect of bone mineral density (BMD) indicators on the long-term prognosis of patients receiving hemodialysis treatment.

**Materials and methods:** The study included 516 patients (269 men and 247 women), whose average age was  $43.9 \pm 12.3$  years. MPC was evaluated using dual-energy X-ray absorptiometry (QDR-4500 Elite device manufactured by Hologic, USA). The average follow-up period was  $2.75 \pm 2.1$  years. The program of applied statistical analysis "StatSoft Statistica v." was used for data processing. 6".

**Results:** Out of 516 patients receiving hemodialysis treatment at the time of completion of the study, fractures were registered in 129 (25%) patients. The absolute risk of fracture increases as the T and Z criteria decrease. An analysis of the sensitivity and specificity of the criteria T and Z deviating from the average value by 1 ( $T \leq -1.0$  and  $Z \leq -1.0$ ) in assessing the risk of fractures showed that the criterion T in all analyzed areas of the skeleton had greater sensitivity and specificity, compared with the criterion Z of the same zones. Single-variant regression analysis showed a statistically significant contribution of densitometric indicators of all the studied skeletal zones to the prediction of fracture risk in patients receiving hemodialysis treatment. Multivariate regression analysis of the prognostic significance of the indicators revealed that the simultaneous use of the criterion T of the forearm bones and L1-L4 vertebrae, in combination with the total duration of hemodialysis, most reliably predicts the risk of fractures in the group of patients receiving hemodialysis treatment.

In a prospective study of 516 patients with CKD treated with hemodialysis, 111 (21.5%) were found to have died. The Kaplan-Meyer survival analysis in the analysis of mortality from cardiovascular pathology showed a significant deterioration in survival in subgroups of patients with osteopenia, osteoporosis in comparison with patients with normal BMD.

**Conclusion:** Diagnostic criteria T and Z adequately reflect the risk of fractures in patients receiving hemodialysis treatment. The greatest prognostic significance in relation to the risk of fractures in patients receiving hemodialysis treatment is the simultaneous use of forearm bones, L1-L4 vertebrae and the duration of renal replacement therapy in the analysis of criteria T ( $p < 0.001$ ). Osteopenia and osteoporosis in patients with CKD are associated with a high risk of death from cardiovascular pathology. The criterion of femoral bone T ( $p < 0.001$ ) has the highest prognostic significance in relation to the risk of death from cardiovascular pathology.

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