DYNAMICS OF OSTEOPOROSIS DEVELOPMENT IN SEVERE BRONCHIAL ASTHMA PATIENTS ACCORDING TO COMPUTER TOMOGRAPHY OF THE CHEST ORGANS

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Abstract. Among patients with severe bronchial asthma (BA), osteoporosis (OP) is highly prevalent, which requires timely diagnosis of mineral metabolism disorders in this category of patients and the initiation of appropriate therapy. For this purpose, micro-X-ray structural analysis of vertebral bone tissue (Th_{12}, L_1–L_2) based on chest computer tomography (Chest CT) is relevant, as it allows for reduced radiation exposure to the patient and minimizes the need for additional X-ray examinations.
The aim: To evaluate the progression of OP in patients with severe asthma using chest CT and to illustrate findings through clinical cases.
Materials and methods. Chest CT in dynamics in 21 severe asthma patients who underwent densitometry with determination of the T-criterion, according to which bone mineral density (BMD) disorders were diagnosed, were analyzed. The T-criterion was determined using the "3D QCT" program in BMD units (mg/cm3) and HU. Further monitoring of the structure (Th_{12}, L_1–L_2) of the vertebrae was carried out using densitometric parameters of axial chest CT slices. In this case, the slices with the lowest densitometric parameters were selected. Control studies were performed after 4 years.
Results. Systemic pathological changes in bone tissue were found in 20 of 21 patients (95.2 %). Osteopenia was detected in 8 patients (38.1 %), and OP in 12 patients (57.1 %). After 4 years, a further decline in densitometric values was observed. All patients with OP had fatty degeneration of the vertebrae, as evidenced by negative minimum densitometric values. Along with the decrease in densitometric indicators, the progression of bronchial obstruction was observed in the studied patients. The most illustrative clinical examples of the study of the dynamics of densitometric indicators (Th_{12}, L_1–L_2) of the vertebrae in patients with severe asthma are presented.
Conclusions. It has been established that patients with severe asthma have systemic pathological changes in bone tissue. After 4 years all patients had a decrease in densitometric indicators (Th_{12}, L_1–L_2) of the vertebrae, which indicates the development and progression of osteopenia and OP in this group of patients.

Key words: bronchial asthma, micro-X-ray structural analysis, computer tomography, densitometry, osteoporosis, osteopenia.