1. STRESZCZENIE W JĘZYKU ANGIELSKIM

Bone tissue metabolism is a dynamic process that involves bone formation and resorption, which is controlled by many factors.

Metabolic disorders of this tissue are a common consequence of chronic liver disease. They usually take the form of osteopenia or osteoporosis. According to data from the literature, the incidence of osteoporosis in patients with chronic liver disease is 20-60%, and the first symptom of it may be a pathological fracture of weakened bone as a result of minor trauma.

The pathophysiological mechanisms underlying the impairment of bone tissue metabolism in chronic liver disease are complex and not fully understood. They include disorders of vitamin D3 metabolism, hyperbilirubinemia, hormonal disorders resulting from liver damage, as well as the etiological factor.

The processes of bone tissue remodeling are regulated by a number of biologically active substances secreted by bone tissue cells, including IGFR-I, RANK, RANKL, MMP-1, MMP-9, collagen type 1.

The purpose of the study was:

1. Evaluation of the expression of IGF-R, RANK, RANKL, MMP-1, MMP-9, type 1 collagen in the bone in experimental hepatic cirrhosis in rats depending on the duration of the experiment.
2. Comparison of the expression of selected proteins in the bone depending on the mechanism causing experimental liver failure in rats.
3. Evaluation of the impact of liver failure on disorders of bone tissue metabolism.

On the basis of the research and the results obtained, the following conclusions were drawn:

1. The increase in the expression of enzymes degrading the intercellular matrix protein MMP-1 and MMP-9 and the increased expression of type 1 collagen in the study group in comparison to the control group indicates intense interosseous matrix reconstruction in rats with hepatic osteodystrophy.
2. Increased expression of the type 1 receptor protein for IGF indicates the intensive influence of growth factors on bone tissue in the conducted experiment.

3. Increased expression of RANK and RANK receptor ligand in the material obtained during the experiment indicates an increase in the activity of bone forming and osteoclastic cells (osteoblasts and osteoclasts) in rats with hepatic osteodystrophy.
4. The study showed that regardless of the mechanism of liver damage, early bone changes are associated with active cleavage (increase in osteoclast activity and enzymes degrading matrix protein) and bone formation (activation of the IGF receptor pathway and increase in osteoblast activity and type 1 collagen expression).