FACTORS INFLUENCING OSTEOPOROSIS IN PATIENTS WITH CORONARY HEART DISEASE AND RHEUMATOID ARTHRITIS

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Abstract *Rheumatoid arthritis is a systemic disease of unclear etiology with autoimmune pathogenesis, which is characterized by chronic erosive polyarthritis. In some patients with rheumatoid arthritis, there is a discrepancy between the processes of bone resorption and bone formation, which is the cause of secondary metabolic osteopathies. Such a complication of rheumatoid arthritis with a change in the quality of bone tissue is osteoporosis. Coronary heart disease in combination with rheumatoid arthritis exacerbates risk factors leading to a decrease in bone density and an increased risk of fractures in osteoporosis, which determines the unfavorable course and significantly worsens the prognosis of the disease. Currently, a number of studies have revealed an association between an increased risk of osteoporosis (in patients with coronary heart disease in combination with rheumatoid arthritis) and the following factors: low mineral bone density, female gender, age over 65 years, early menopause, weight less than 57 kg, family history of osteoporosis, previous fractures, long-term rheumatoid arthritis and irrational glucocorticosteroid therapy. This article presents the results of an analysis of the factors leading to the development of osteoporosis in patients with coronary heart disease in combination with rheumatoid arthritis who are undergoing inpatient treatment in the rheumatology department.*

Keywords: *osteoporosis, coronary heart disease, rheumatoid arthritis, risk factors, cardiovascular diseases, glucocorticosteroids, bone mineral density.*

INTRODUCTION

In modern medicine, much attention is paid to the study of comorbid pathology. It is known that the main problem for modern healthcare is diseases of the cardiovascular system, in particular coronary heart disease (CHD), which leads to disability and increased mortality of the able-bodied population. Rheumatoid arthritis (RA), common from 0.5% to 2% in different populations It has a chronic course, during which immuno-mediated osteopathies are formed a second time. The most common complication of chronic immune inflammation in rheumatoid arthritis is osteoporosis (OP). As a result of micro-injuries and mineralization disorders, the density and mass of bone tissue decreases. Such progressive changes in bone quality contribute to a decrease in the rate of its remodeling, which increases the risk of fractures. In the works devoted to the study of osteoporosis in rheumatoid arthritis, it has been found that bone mineral density (BMD) has reduced values not only in the area of inflamed joints. The data of the conducted studies suggest an adverse effect of a decrease in bone mineral density on the course and prognosis of rheumatoid

arthritis. The prevalence of osteoporosis in rheumatoid arthritis is 2-3 times higher than in the population, however, insufficiently studied risk factors for the development of osteoporosis in patients with combined pathology: Coronary heart disease and rheumatoid arthritis. It is necessary to focus the attention of rheumatologists on the social significance of this problem, which consists in the need for early detection of bone loss and preventive and therapeutic measures in patients with coronary heart disease in combination with RA. Analysis of factors that increase the risk of fractures, disability, and disability, is relevant today, since the key medical, social and economic importance in healthcare is the quality of life associated with health.

The aim of the study is to analyze the factors leading to the development of osteoporosis in patients with coronary heart disease in combination with rheumatoid arthritis.

Achieving the goal includes solving the following tasks:

1) studying the prevalence of osteoporosis in patients with coronary heart disease in combination with rheumatoid arthritis;

2) identification of possible risk factors for osteoporosis in patients coronary heart disease in combination with rheumatoid arthritis;

3) assessment of the identified risk factors for osteoporosis in patients with coronary heart disease in combination with rheumatoid arthritis.

MATERIALS AND METHODS OF RESEARCH

A retrospective analysis of 215 patient case histories served as a source of information for solving the research tasks. The data obtained are structured according to the identified main socio-demographic characteristics (gender, age) and the most significant risk factors for cardiovascular pathology and RA (low body weight, early menopause, bone mineral density (BMD), family history, smoking, duration, degree and stage of RA, therapy glucocorticosteroids (GCS)). BMD in all patients was assessed in LI-LIV and in the proximal femur on a dual-energy radiological bone densitometer using a point beam of X-ray radiation. The following indicators were calculated: MPC in g/cm^2, T-criterion. In accordance with the recommendations WHO The T-criterion greater than -1 was regarded as the norm, less than -1 and more than -2.5 – as osteopenia, less than -2.5 – as osteoporosis. The study included patients who had no other diseases other than coronary heart disease and RA that could cause effect on bone metabolism. Patients with only a stable form were taken into account CHD. A statistical analysis was carried out using an application software package STATISTICA 6.0. To compare the groups, the Student's t-test, the criterion Mann-Whitney, a Pearson correlation analysis was performed. The value of $p<0.05$ was considered statistically significant.

THE RESULTS AND THEIR DISCUSSION

A comorbid diagnosis of coronary heart disease with rheumatoid arthritis was made in 21 cases (10%). There were 17 women (81%) and 4 men (19%) among patients with rheumatoid arthritis. In the first age group (20-40 years old) there were 3 people (15%), of whom 1 was a man (33%) and 2 were women (67%). In the second age group (41-60 years

old) there were 8 people (42%), of whom 1 was a man (12.5%) and 7 were women (87.5%). In the third age group (61-80 years old) there were 10 people (43%) – 2 men (20%), 8 women (80%). The average age of men was 50.5 ± 14.8 years, of women – 56.5 ± 13.8 years. Among the women, there were 13 patients (76%) with a reliable diagnosis of postmenopausal rheumatoid arthritis. Gender and age of patients are the determining factors in the development of osteoporosis. With age, especially after the age of 65, BMD gradually decreases and the risk of developing osteoporosis increases. It has been shown that the decrease in the mass of the trabecular bone begins as early as 20, and the decrease in the mass of the cortical bone begins after 30 years. After after menopause, bone resorption begins to increase, as a result of which spongy bones can lose more than 5% of their mass, and the entire bone mass can decrease by 1-1.5% annually, and this process can last up to 15-20 years after menopause. A decrease in BMD was found in 12 patients (57%). Of these, four patientshad osteoporosis (19%), 8 patients had osteopenia (38%). At the same time, in women, BMD in LILI and in the proximal femur was statistically lower than in men ($p<0.05$). When assessing the effect on BMD of factors such as age, BMI, menopause, activity, stage and manifestations of RA, duration of RA, taking GCS, it was found that patients with a duration of RA for more than 10 years, high and moderate clinical and laboratory activity, duration of taking GCS for more than 5 months, as well as women who were in menopausal patients had significantly lower BMD in the lumbar spine and in the proximal thigh ($p<0.05$). More frequent detection of osteoporosis in coronary heart disease in combination with RA in women is associated with both estrogen deficiency that occurs during menopause and with initially low bone mass compared to men. The average weight of men was 71.8 ± 19.0 kg, of women – 69.3 ± 10.8 kg. BMI is less 20 was detected in 1 person (5%), 20-24.9 – in 16 people (76%), 25 – 29.9 – in 4 people (19%). The average BMI in men was 23.23 ± 3.32, in women – 25.71 ± 4.05. Among the risk factors for osteoporosis were the following: smoking – in 5 people (25%), fractures – in 1 person (5%), burdened heredity for rheumatoid arthritis – in 2 people (10%). It is known that the MPC in smokers is 1.5– 2 times lower than in non-smokers. Smoking contributes to the development and progression of both OP, so is RA. The genetic components of these diseases are formed due to the interaction of many genes, one of which is the apolipoprotein E (ApoE) gene, namely the E4 allele (ApoE4), which determines the development of OP in patients with RA. Therapy of rheumatoid arthritis with systemic glucocorticosteroids (GCS) leads to bone loss, which is the cause of osteoporosis.In our study, Dexamethasone was prescribed from systemic GCS in 62% of cases, Methylprednisolone in 48% of cases. Taking even minimal doses of GCS, which suppress bone formation processes and increase bone resorption, increases the risk of OP and fractures.

When assessing the main characteristics of rheumatoid arthritis , 18 people (86%) had the 2nd degree of activity, and 3 people (14%) had the 3rd degree of activity. According to the X–ray stage, the patients were distributed as follows: stage II – 8 people (38%), III – 10 people (48%), IV - 3 people (14%). When studying the results of laboratory tests, all

patients (100%) had an increase in CRP (more than 0.5 g/l), 7 people (33%) had an increase in ESR to 20 mm/h, in 14 people (67%) – more than 20 mm /h. In the study group, the number of seropositive patients in the to 19 people (90%), seronegative patients – 2 people (10%). According to the medical history, in 14 people (67%) the duration of rheumatoid arthritis was less than 10 years, in 7 people (33%) – more than 10 years. When assessing the effect of factors such as activity, X-ray stage, duration of RA, level of CRP, RF on BMD, no statistically significant association of these factors with a decrease in BMD was revealed. However, we found a negative correlation of average strength between the decrease in MPC and the level of CRP.

CONCLUSIONS

Patients with coronary heart disease in combination with rheumatoid arthritis have a high risk of developing osteoporosis, which is consistent with the literature data. Osteoporosis in this comorbid pathology is caused by various factors. The following play an important role in its development: female gender, age over 60 years, postmenopause, previous fractures, smoking, family history of RA, GCS therapy, decreased BMD, increased CRP. A statistically significant correlation was revealed between BMD and clinical and laboratory activity of RA, female sex, menopause, BMI below 25 kg/m^2, long-term the intake of GCS and the level of CRP. In modern medicine, there is no consensus about the leading factor and mechanism of osteoporosis development, which may be a manifestation or complication of rheumatoid arthritis. In the prevention of osteoporosis, progression of bone destruction, fractures, it is of theoretical and practical importance to study the features of the development and manifestation of osteoporosis in IBD in combination with rheumatoid arthritis. This problem currently remains relevant and promising for research.

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