

GENDER CHARACTERISTICS OF THE CURRENT RHEUMATOID ARTHRITIS

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ABSTRACT: Rheumatoid arthritis in women is characterized by a more severe course of the pathological process, and the lesion of individual joints depends on the gender of patients (in men, changes in the sacroiliac joints, the development of tendovaginitis, intra-articular Goff bodies are more often noted, and in women — the proximal interphalangeal joints of the fingers of the upper and lower extremities, maxillary and knee joints). There is a sexual dimorphism of the integral extraarticular (systemic) manifestations of rheumatoid arthritis, while men have more frequent lung damage and the peripheral nervous system, and exclusively in the female group — Sjogren's syndrome and changes from the central nervous system. In patients with rheumatoid arthritis, the parameters of bone metabolism in the blood serum change, in addition, in patients with osteoporosis, there are common and gender differences in the concentrations of osteoassociated hormones and chemical elements.

Key words: rheumatoid arthritis, course, men, women.

INTRODUCTION

Female gender is a risk factor for rheumatoid arthritis (RA), and women hospitalized with this disease account for 75-80% of all cases of the disease. It should be noted that RA is accompanied by certain gender-specific features of the course of the pathological process, which are generally characterized by a more severe course of the disease in women. Sexual dimorphism of RA in men and women is manifested by differences in the frequency of metabolic syndrome, venous thrombosis, and the development of involvement in the pathological process of sternoclavicular joints, lumbar spine and lungs. However, the sexual dimorphism of the course of RA has still not been sufficiently studied, the degree of gender influence on the clinical and X-ray sonographic nature of joint damage, the development of osteoporosis and extraarticular (systemic) manifestations of the disease has not been determined, which determined the goals and objectives of this study.

MATERIALS AND METHODS OF RESEARCH

293 RA patients aged 17 to 79 years (on average 45.60 ± 0.68 years) were under observation. Among these patients there were 20% of men aged 43.50 ± 1.36 years and 80% of women aged 46.20 ± 0.78 years. The duration of clinical manifestation of RA in the male and female groups, respectively, was 7.90 ± 0.91 years and 9.60 ± 0.46 years. The seropositive variant of the disease at the time of examination was established in 3/4 of the observations, I degree of activity of the process — in 20%, II — in 46%, III — in 34%; I X-ray stage - in 9%, II — in 39%, III — in 34 %, IV — in 19%. The joint score was 20.60 ± 0.51 , the Ritchie index was 40.20 ± 1.18 points, the Lansbury index was 156.80 ± 4.19 points, the arthritis progression index (IPA) was 1.50 ± 0.13 oe. Extra-articular (systemic) manifestations of RA were found in 29% of cases. Patients underwent X-ray (MultixCompact-Siemens, Germany) and ultrasound (Envisor-Philips, the Netherlands) examination of joints, sacroiliac joints and spine, as well as dual-energy X-ray

osteodensitometry of the proximal femur bones (QDR-4500-Delphi-Hologic, USA). The radiological osteoassociated Barnett-Nordin meta—carpal index and bone mineral density indices were evaluated. IPA was evaluated using the formula:

$$IPA = (S^2 + \sum) / T$$

where S is the stage of the disease, \sum is the sum of the X—ray sonographic signs, T is the duration of the disease. Using the BS-200 biochemical analyzer (China), we studied the activity indicators of alkaline phosphatases (alkaline phosphatase) in blood serum. Using the method of atomic emission spectrometry with inductively coupled argon plasma (IRIS-Intrepid-IIXDL, Great Britain), the blood parameters of osteoassociated macronutrients — calcium (Ca), magnesium (Mg) and phosphorus (P) were determined, and by atomic absorption spectrometry with an electrographite atomizer (SolAAr-Mk2-MOZe apparatus, Great Britain) — the content of osteoassociated trace elements — copper (Cu), iron (Fe), manganese (Mn), lead (Pb), strontium (Sr) and zinc (Zn). By enzyme immunoassay (Sanofi reader PR2100 diagnostic Pasteur, France; DRG kits, USA) examined the serum levels of parathyroid hormone (PG), calcitonin (CT) and osteocalcin (OK). Statistical processing of the obtained research results was carried out using computer variational, correlation, single- (ANOVA) and multifactorial (ANOVA/MANOVA) analysis of variance (Microsoft Excel and Statistica programs StatSoft). The average values (M), standard deviations (SD) and errors, correlation coefficients, variance criteria (D), Student, Wilcoxon — Rao, MacNemar — Fisher (χ^2) and the reliability of statistical indicators (p).

THE RESULTS AND THEIR DISCUSSION

According to the data of a single-factor analysis of variance, the gender of patients does not affect the seropositivity of RA, the degree of activity of the pathological process, the stages of the disease, the prevalence of joint syndrome, the Ritchie, Lansbury and IPA indices. At the time of the examination, increased rheumatoid factor levels in the blood (> 15 IU/ml) were found in 72% of men and 76% of women. Moderate and high levels of RA activity were found in 72% of men and 82% of women ($p = 0.032$), and stages III–IV of the disease were found in 43 and 55% of cases, respectively ($p = 0.002$). Thus, it is possible to state a more severe course of RA in women, which is confirmed by the literature data. At the same time, according to the average parameters of joint counting, Ritchie and Lansbury indices, the IPA groups of men and women differed little from each other. Systemic osteoporosis was found in 43% of men and 49% of women. The metacarpal index in the first group was 0.440 ± 0.007 units, and in the second — 0.430 ± 0.004 units, the T index (according to densitometry) was -1.560 ± 0.178 SD and $-1,55 \pm 0,089$ SD. Average values of markers of bone metabolism (PG, CT, OK, alkaline phosphatase, Ca, Cu, Fe, Mg, Mn, P, Pb, Sr, Zn in blood serum) in men and women did not differ from each other. According to the Wilcoxon— Rao multifactorial analysis, the sex of RA patients has little effect on the integral state of osteoassociated hormones and chemical elements in the blood, whereas a single-factor analysis of variance indicates a significant dependence on the sex of the parameters in the blood of PG and Mn. In the group of men, there is no influence of the degree of activity of the pathological process on the integral indicators of bone metabolism, although there are reliable direct correlations of RA activity with serum levels of Cu and Sr, as well as an inverse correlation with Zn concentration. In addition, the stage of the disease positively correlates with the content of Mn, and IPA — inversely with Fe and directly with

Sr. In women suffering from RA, there is a significant effect of disease activity on the integral state of bone metabolism, although the parameters of the degree of activity correlate only with the level of Cu in the blood. Taking into account the existing direct connection, we found that, regardless of the gender of patients, the indicators in serum Cu > 1200 mcg/l (> M + SD of patients) indicate a high degree of RA activity. In men, damage to the elbow and shoulder joints it significantly affects the integral state of bone metabolism. In turn, the latter in women is associated with the severity of changes in the proximal interphalangeal joints of the hands and feet, the presence of severe osteosures, aseptic osteonecrosis, digital arteritis and osteoporosis. In the group of men with osteoporosis, the PH values were significantly higher than in the rest of the examined, 2.2 times and the OK was 37% higher. In women, PG values increase significantly ($p < 0.001$) by 80%, OK — by 40%, and alkaline phosphatase — by 31% with a decrease CT content by 42% and Mg content by 8%. Taking into account the data obtained, the following conclusions of practical significance were made: in men with RA, PH values > 80 pg/ml, and in women > 70 pn/ml at a level of OK > 20 ng/ml (> M + SD of patients with osteoporosis), regardless of gender, indicate the presence of systemic osteodeficiency.

According to ANOVA/MANOVA, the gender of RA patients has a significant effect ($p = 0.005$) on the frequency of damage to individual joints (the so-called articular landscape). The results of the performed ANOVA demonstrate a reliable dependence on the gender of patients of the frequency of lesions of the proximal interphalangeal joints of the hands and feet, knee and sacroiliac joints. Men are significantly 2.2 times more likely to develop rheumatoid sacroiliitis, but 85% less likely to develop damage to the maxillary joints, 15% more likely to develop proximal interphalangeal fingers, 25 % — toes, 12% — knee. Therefore, it can be concluded that the male sex belongs to the risk factors for damage to the sacroiliac joints, and the female — maxillary and knee. Univariate analysis of variance demonstrates a significant effect of the gender of RA patients on the development of tendovaginitis and intraarticular Goff bodies. Men are 36% more likely than women to have tendovaginitis and 4.6 times more likely to have Goff's body. Thus, the male gender can be attributed to the predictors the occurrence of tendovaginitis and intraarticular Goff bodies in cancer. According to the results of the Wilcoxon—Rao analysis, the gender of RA patients significantly affects integral extraarticular (systemic) signs of the disease. At the same time, a single-factor analysis of variance shows the dependence of lung pathology (interstitial pneumonitis, fibrosing alveolitis, rheumatoid nodes) and the peripheral nervous system (polyneuropathy, radiculopathy) on gender, as well as the risk of developing Sjogren's syndrome. Men are 2.8 times more likely than women to have pulmonary pathology and 2.5 times more likely to have changes in the peripheral nervous system. Thus, the male sex of RA patients becomes a risk factor for these extraarticular signs of the disease. The severity of joint damage in men, estimated by the Ritchie and Lansbury indices, determines the level of Mn in the blood, the presence of sacroiliitis, changes in joint menisci and nephropathy (mesangioproliferative and mesangiocapillary glomerulonephritis, AA-amyloidosis) — the content of OK, Baker's cysts and digital arteritis — Cu concentration, osteosuration —Mg, Sjogren's syndrome and peripheral polyneuropathy — Mn, Pellagri—Steidi—Sr intraarticular bodies, major osteocystic and intraarticular Goff's bodies are Zn. In women, the content of PG is significantly affected by aseptic osteonecrosis, Pellagri — Steidi bodies, lung and

central nervous system damage (dyscirculatory encephalopathy), CT levels — the presence of pronounced osteosures, OK — enthesopathy, the activity of alkaline phosphatase — osteocystic, calcemia parameters — osteosures, aseptic osteonecrosis, digital arteritis and meniscal changes, for cupremia, only changes in the horns of the menisci, for Mg blood counts, the development of tendovaginitis.

CONCLUSIONS

1. RA in women is characterized by a more severe course of the pathological process, and the integral joint lesion (articular landscape) depends on the gender of patients; in men, sacroiliac joints are more often affected, the development of tendovaginitis and intraarticular Goff bodies is noted, and in women, the disease is characterized by a greater degree of damage to the proximal interphalangeal joints of the fingers of the upper and lower extremities, maxillary and knee joints.

2. There is a sexual dimorphism of integral extraarticular (systemic) manifestations of RA, when at the same time, men have more frequent lesions of the lungs and peripheral nervous system, and exclusively in the female group — Sjogren's syndrome and changes from the central nervous system, which reflects additional gender characteristics of the course of the pathological process.

3. In patients with RA, the parameters of bone metabolism in the blood serum change, in addition, in patients osteoporosis has a commonality and gender differences in the concentrations of osteoassociated hormones and chemical elements, which requires consideration by practitioners in the context of the diagnosis of the pathological process in men and women, as well as monitoring the effectiveness of therapeutic measures.

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