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METABOLIC SYNDROME AS A PREDICTOR OF CARDIOVASCULAR RISK IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Abstract: Rheumatoid arthritis and metabolic syndrome share common pathogenic mechanisms that contribute to chronic inflammation and increase the risk of cardiovascular complications. This study aimed to evaluate the impact of metabolic syndrome on disease activity and cardiovascular risk in patients with rheumatoid arthritis. A total of 100 patients with rheumatoid arthritis underwent comprehensive clinical, laboratory, and echocardiographic examinations and were divided according to the presence of metabolic syndrome. Patients with metabolic syndrome demonstrated significantly higher disease activity, a greater prevalence of arterial hypertension, elevated total cholesterol levels, and increased left ventricular myocardial mass compared with those without metabolic syndrome ($p < 0.05$). The findings indicate that metabolic syndrome is an important predictor of cardiovascular risk and should be routinely assessed in patients with rheumatoid arthritis to improve long-term clinical outcomes.

Keywords: rheumatoid arthritis, metabolic syndrome, cardiovascular risk, arterial hypertension, left ventricular hypertrophy, inflammation, DAS-28, obesity, cholesterol, echocardiography.

МЕТАБОЛИЧЕСКИЙ СИНДРОМ КАК ПРЕДИКТОР СЕРДЕЧНО-СОСУДИСТОГО РИСКА У ПАЦИЕНТОВ С РЕВМАТОИДНЫМ АРТРИТОМ

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Аннотация: Ревматоидный артрит и метаболический синдром имеют общие патогенетические механизмы, способствующие хроническому воспалению и повышению риска сердечно-сосудистых осложнений. Целью исследования явилась оценка влияния метаболического синдрома на активность ревматоидного артрита и формирование сердечно-сосудистого риска. В исследование были включены 100 пациентов с ревматоидным артритом, которым проведены комплексное клиническое, лабораторное и эхокардиографическое обследование с разделением на группы в зависимости от наличия метаболического синдрома. У пациентов с метаболическим синдромом выявлены более высокая активность заболевания, большая распространенность артериальной гипертензии, повышенный уровень общего холестерина и увеличение массы миокарда левого желудочка по сравнению с пациентами без метаболического синдрома ($p < 0,05$). Полученные результаты свидетельствуют о том, что метаболический синдром является важным предиктором сердечно-сосудистого риска и должен учитываться при ведении пациентов с ревматоидным артритом.

Ключевые слова: ревматоидный артрит, метаболический синдром, сердечно-сосудистый риск, артериальная гипертензия, гипертрофия левого желудочка, воспаление, DAS-28, ожирение, холестерин, эхокардиография.

Introduction: Rheumatoid arthritis (RA) is a chronic autoimmune inflammatory disease characterized by persistent synovitis, progressive joint destruction, and systemic manifestations. In addition to musculoskeletal damage, patients with RA have a substantially increased risk of cardiovascular disease, which remains one of the leading causes of morbidity and mortality. Metabolic syndrome, including abdominal obesity, insulin resistance, arterial hypertension, dyslipidemia, and impaired glucose metabolism, is frequently detected in patients with RA and may further aggravate cardiovascular complications. Chronic systemic inflammation, endothelial dysfunction, and excessive production of pro-inflammatory cytokines, including tumor necrosis factor-α and interleukin-6, represent common pathogenic mechanisms linking RA and metabolic syndrome. The coexistence of these

conditions contributes to accelerated atherosclerosis, increased myocardial remodeling, and deterioration of disease activity. Previous studies have demonstrated that patients with RA and metabolic syndrome exhibit higher inflammatory activity, greater prevalence of hypertension, and less favorable metabolic profiles than patients without metabolic syndrome. Therefore, early recognition of metabolic syndrome is essential for cardiovascular risk stratification and optimization of therapeutic strategies in patients with RA. Comprehensive clinical assessment of metabolic disturbances may improve disease management, reduce cardiovascular complications, and contribute to better long-term outcomes. Understanding the interaction between RA and metabolic syndrome remains an important direction of modern rheumatology and internal medicine.

Aim of the study: To evaluate the influence of metabolic syndrome on disease activity and cardiovascular risk in patients with rheumatoid arthritis by analyzing clinical, laboratory, and echocardiographic parameters.

Materials and methods. A prospective observational study included 100 patients with confirmed rheumatoid arthritis diagnosed according to the 2010 ACR/EULAR classification criteria. The participants were 21–81 years of age, with a mean age of 55 ± 12.4 years, and were treated at a specialized rheumatology center. Patients were divided into two groups according to the presence of metabolic syndrome: 59 patients with metabolic syndrome and 41 patients without metabolic syndrome. All participants underwent comprehensive clinical evaluation, including assessment of joint pain, swollen and tender joint counts, disease activity using the DAS-28 index, anthropometric measurements, body mass index, and blood pressure. Laboratory investigations included rheumatoid factor, anti-cyclic citrullinated peptide antibodies, C-reactive protein, erythrocyte sedimentation rate, fasting glucose, serum creatinine, and total cholesterol. Echocardiography was performed to evaluate left ventricular mass, left ventricular mass index, ejection fraction, ventricular wall thickness, and diastolic function. Radiographic assessment of joint damage was carried out according to the Kellgren classification. Statistical analysis was performed using STATISTICA 10.0

software. Quantitative variables were analyzed using the Mann–Whitney U test, categorical variables by the χ^2 test, and correlations by Spearman's coefficient. Differences were considered statistically significant at $p < 0.05$.

Results. Metabolic syndrome was identified in 59% of patients with rheumatoid arthritis. Patients with metabolic syndrome demonstrated significantly higher disease activity than those without metabolic syndrome, with a mean DAS-28 score of 5.58 ± 0.90 compared with 5.23 ± 0.85 ($p = 0.02$). Body mass index, fasting glucose, and total cholesterol levels were significantly higher in the metabolic syndrome group. Arterial hypertension was diagnosed in 63% of patients with metabolic syndrome compared with only 16.3% of patients without metabolic syndrome, indicating a 3.8-fold increase in prevalence. Echocardiographic examination revealed significantly greater left ventricular myocardial mass in patients with metabolic syndrome, reflecting more pronounced cardiac remodeling. Left ventricular hypertrophy was observed 1.5 times more frequently in patients with metabolic syndrome and was detected even in the absence of arterial hypertension in some individuals, suggesting the independent influence of metabolic disturbances on myocardial structure. Patients with metabolic syndrome also received significantly higher daily glucocorticoid doses than those without metabolic syndrome. No significant differences were observed regarding inflammatory laboratory markers or the use of disease-modifying antirheumatic drugs between the study groups. Overall, the presence of metabolic syndrome was associated with increased rheumatoid arthritis activity, unfavorable metabolic characteristics, structural cardiac changes, and a markedly higher cardiovascular risk. These findings emphasize the importance of routine screening for metabolic syndrome and cardiovascular abnormalities in patients with rheumatoid arthritis.

Conclusions: Metabolic syndrome is strongly associated with increased disease activity and a higher cardiovascular risk in patients with rheumatoid arthritis. The coexistence of these conditions contributes to a greater prevalence of arterial hypertension, elevated cholesterol levels, increased left ventricular myocardial

mass, and more frequent left ventricular hypertrophy. Comprehensive evaluation of metabolic syndrome using clinical, laboratory, and echocardiographic assessment may improve cardiovascular risk stratification and optimize patient management. Early diagnosis and individualized treatment of metabolic abnormalities should be considered an essential component of comprehensive care for patients with rheumatoid arthritis.

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