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EVALUATION OF CAROTID INTIMA-MEDIA THICKNESS AS AN EARLY PREDICTOR OF ATHEROSCLEROSIS IN RHEUMATOID ARTHRITIS PATIENTS

Mukhabbat Mukhiddinovna Saidova
Candidate of Medical Sciences
Associate Professor at the Department of Reabilitology,
sports medicine and physical education
Bukhara State Medical Institute
Bukhara. Uzbekistan

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Abstract:

Cardiovascular disease (CVD) is one of the leading causes of death and disability worldwide. Rheumatoid arthritis is a common chronic connective tissue disease in adults and children, which leads to destruction of symmetrical joints. According to the European Society of Cardiology, "...over 4 million people die each year from CVDs, of which 1.4 million under 75 years old, accounting for 45% of all deaths...". According to major research centres, cardiovascular mortality (CVD) is more common in patients with rheumatoid arthritis (RA) than in the general population.

Keywords: Rheumatoid Arthritis, Cardiovascular Risk, Prevention, Atherosclerotic Lesions, Doppler Method, Atherosclerotic Vascular Lesions.

INTRODUCTION:

Rheumatoid arthritis (RA) is one of the leading rheumatic diseases and is a disease of high medical and social significance due to its high prevalence and progressive course, which leads to early disability in patients of working age. According to multicentre studies, cardiovascular morbidity and mortality in patients with rheumatoid arthritis are higher than in the general population [1, 2]. Rheumatoid arthritis is based on autoimmune inflammation, in which the immune system begins to "attack" its own cells instead of "attacking" the body's enemies (microbes, viruses, tumour cells) due to a malfunction of the immune system. An immune response is formed, resulting in damage to the body's own tissues or organs. The cells of the immune system produce specific proteins - various antibodies, against the body's own cells - autoantibodies. Some of these are called rheumatoid factor (RF) and are regularly assessed in your blood when tests are taken, not only to clarify the diagnosis, but also during treatment. The level of rheumatoid factor characterises the activity of the disease and helps assess the effectiveness of treatment. Rheumatoid arthritis primarily affects joint tissue. In many people, the initial symptoms of arthritis are very vague and include weakness, muscle pain and low-grade fever. The results of large multicentre studies suggest that the immunoinflammatory cascade in systemic connective tissue diseases contributes to the progression of the atherosclerotic process [3, 4]. This group of patients has a high rate of cardiovascular morbidity. Evaluation of traditional cardiovascular risk factors (CVR) does not reflect the actual prognosis in patients (5). One of the main causes of mortality in RA is cardiovascular accidents (myocardial infarction (MI), stroke, sudden cardiac death) due to the early development and rapid progression of atherosclerotic vascular lesions [6, 7]. These findings are consistent with the results of a meta-analysis, which showed that patients with early RA have significantly higher intima-media thickness (IMT) and the incidence of carotid atherosclerotic plaques compared with controls, and high inflammatory activity contributes significantly to the increase in IMT of carotid arteries [8]. The solution to this problem involves assessing the prevalence of CVDs, cardiovascular risk factors and metabolic disorders; as well as identifying groups of patients predisposed to the development of cardiovascular complications (CVCs) in order to implement a set of preventive and therapeutic measures aimed at reducing cardiovascular risk [9, 10, 11].

STUDY OBJECTIVE:

To evaluate the parameter of carotid artery intima-media thickness (CMI) as an early predictor of atherosclerosis development in patients with rheumatoid arthritis (RA).

MATERIALS AND METHODS OF THE STUDY:

In the Department of Rheumatology of Bukhara Regional Multidisciplinary Medical Center, 89 patients aged 35 to 60 years who were treated for

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rheumatoid arthritis were prospectively examined in 2018. Hereditary predisposition, physical inactivity, obesity, hypercholesterolemia, and the presence or absence of smoking were identified. The diagnosis of rheumatoid arthritis was based on the ACR and ACR / EULAR criteria. Heredity, smoking, rheumatoid factor, hypercholesterolemia, abdominal obesity, C-reactive protein, and the incidence of arterial hypertension, coronary heart disease, and diabetes were evaluated to determine the frequency of cardiovascular risk factors in patients with rheumatoid arthritis. The mSCORE scale (SCORE/EULAR) was used for early detection and prediction of cardiovascular risk. In these patients, the thickness of intima-media complex (IMC) in the carotid arteries was determined by Doppler imaging as an early sign of cardiovascular disease development.

RESULTS:

The results obtained by determining the intima-media complex (IMC) thickness of the common carotid artery in patients with RA were 0.98 ± 0.18 mm in the right carotid artery and 1.01 ± 0.18 mm in the left carotid artery. An abnormal increase in this index (>0.9 (mm)) was found in more than half of the patients in the study, 49(55.1%) cases, and the CMR was 1.13 ± 0.07 mm in the right carotid artery and 1.16 ± 0.07 mm in the left carotid artery. The CMR in patients with seronegative RA was 1.12 ± 0.07 mm in the right carotid artery and 1.15 ± 0.07 mm in the left carotid artery, and in patients with seropositive RA it was 1.13 ± 0.07 mm in the right carotid artery and 1.17 ± 0.06 mm in the left carotid artery. Analysis of this index based on patient age showed that the mean value (mm) of the CMB was 0.82 ± 0.12 mm in the right carotid artery, 0.84 ± 0.12 mm in the left carotid artery in the patient group aged 35-49 years and in the patient group aged 50-60 years this index was 1.06 ± 0.14 mm in the right carotid artery and 1.08 ± 0.15 mm in the left carotid artery (Table 1). The analysis showed that the CMB thickness directly correlated with the age of the patients (r = 0.64), an increase in CMB > 0.9 mm was observed in 46 (74.2%) patients aged 50-60 years, 1.13 ± 0.07 mm in the right carotid artery and 1.16 ± 0.07 mm in the left carotid artery.

Table 1
Diagnosis of atherosclerosis in RA patients

Indicators	Number of patients	35-49 years old	50-60 years old
n (%)	89	27(30,3%)	62(69,7 %)
Average age	51,5±7,12	42,2± 4,4	55,5±3,15
intima-media complex (mm) Right carotid artery Left carotid artery	 0,98±0,18 1,01±0,18	 0,82±0,12 0,84±0,12	 1,06±0,14 1,08±0,15
TIM≤ 0.9 (mm.) n (%) Right carotid artery Left carotid artery	40(44,9%) 0,81±0,08 0,82±0,06	24(88,9%) 0,79±0,08 0,81±0,07	16(25,8%) 0,84±0,06 0,84±0,05
TIM≤ 0.9 (mm.) n (%) Right carotid artery Left carotid artery	49(55,1%) 1,13±0,07 1,16±0,07	3(11,1%) 1,07±0,06 1,13±0,06	46(74,2%) 1,13±0,07 1,16±0,07

Analysis of the association of CMR with cardiovascular risk factors in patients with RA showed that in 26.5% of patients with risk factor 1, CMR was >0.9 mm higher, and in patients with risk factors 2 and 3, 28.6 and 42.9%, respectively (Table 2).

Table 2
Incidence of CMR parameters with risk factors in patients with RA in patients with RA

Indicators	Number of patients (n=89)	intima-media complex ≤ 0,9(мм.) (n=40)	intima-media complex ≤ 0,9(мм.) (n=49)
No risk factor	11 (12,4%)	10(25%)	1(2 %)
1 risk factor	27 (30,3%)	14(35%)	13(26,5%)
2 risk factors	20 (22,5%)	6(15%)	14(28,6%)
≥3 risk factors	31 (34,8%)	10(25%)	21(42,9%)

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Evaluation of carotid CMR in patients with RA based on cardiovascular risk levels determined by mSCORE scale showed that pathological CMR increase in patients in medium and high risk groups was detected in 67.3 and 14.3% of cases. In very high-risk patients, CMR values greater than >0.9 mm were observed in all patients and were 1.19 ± 0.06 mm in the left carotid artery and 1.16 ± 0.05 mm in the right carotid artery.

Thus, in patients with RA, abnormal CMB enlargement (>0.9 mm) was observed in 55.1% of patients, and it had a correct correlation with patient age (r = 0.64); at age 50-60 years, it was observed in 74.2% of patients and was 1.13 ± 0.07 mm in the right carotid artery and 1.16 ± 0.07 mm in the left carotid artery. The CMI index was also associated with CVD risk, as determined by the mSCORE scale: a value greater than >0.9 mm was found in 67.3 of the mean groups. Common carotid artery CMR indexes in patients with RA are associated with the age of patients, the number of FR meetings, disease activity and have great prognostic value in the early detection of cardiovascular risk.

CONCLUSION:

The determination of CMR has diagnostic value for the evaluation of remodeling and atherosclerotic vascular lesion features and practical significance as a predictor of vascular accidents in patients with RA.

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