STUDY OF ATHEROSCLEROTIC CHANGES IN THE CAROTID ARTERIES IN PATIENTS WITH SYSTEMIC SCLERODERMA

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Introduction. Autoimmune diseases, including systemic sclerosis (SSc), are associated with various complications, with vascular issues being among the most significant contributors to morbidity and mortality. One of the leading causes of mortality in patients with autoimmune diseases, particularly in systemic sclerosis, is the development of vascular complications [2]. These complications are primarily driven by the early onset and rapid progression of atherosclerotic lesions in the vascular system. Systemic sclerosis is characterized by immune-mediated damage to small blood vessels, which can lead to endothelial dysfunction, impaired blood flow, and progressive fibrosis of vascular tissues. The abnormal vascular remodeling and endothelial injury in SSc patients create an environment conducive to the development of atherosclerosis, a condition where plaques of fat, cholesterol, and other substances accumulate on the arterial walls [1]. This leads to narrowing and hardening of the arteries, which can reduce blood flow and increase the risk of cardiovascular events such as stroke, myocardial infarction, and other life-threatening conditions. The pathophysiology of accelerated atherosclerosis in SSc remains incompletely understood but is believed to involve a complex interaction between endothelial cell damage, inflammation, immune system dysregulation, and impaired vascular repair mechanisms [3]. Moreover, SSc patients often present with a combination of traditional cardiovascular risk factors (such as hypertension and dyslipidemia) and disease-specific factors, making them particularly vulnerable to the early development of atherosclerotic changes [5]. The rapid progression of atherosclerosis in this population, coupled with the associated vascular complications, emphasizes the need for early detection and proactive management of cardiovascular risk factors in patients with systemic sclerosis. Monitoring vascular health, identifying early atherosclerotic changes, and implementing preventive measures can play a crucial role in reducing cardiovascular-related morbidity and mortality in SSc patients [4].

Objective: To investigate the features of carotid artery damage in systemic scleroderma.

Materials and Methods. The study included 88 female patients diagnosed with SSc (according to the ACR diagnostic criteria, 2013), who were hospitalized in the cardiorheumatology and rheumatology departments of the 1st clinic of TMA. The patients' ages ranged from 18 to 58 years (mean 35.6±0.7 years), and the duration of the disease ranged from 1 to 552 months (mean 132.9±7.7 months). The control group (n=65) consisted of individuals without signs of rheumatic, infectious, or exacerbation of chronic inflammatory diseases. At the time of the study, the number of patients with moderate disease activity was 41.0%, while low and high activity were equally represented at 29.5% each. Atherosclerotic vascular damage was detected using ultrasonography (US) of the carotid arteries. The intima-media complex (IMC) thickness of the carotid arteries (mm) was measured. Atherosclerotic damage was evaluated by the IMC thickness (0.9 to 1.2 mm) and the presence of atherosclerotic plaques (ASP), which were defined as a localized increase in IMC thickness > 1.2 mm.

Results. Ultrasound examination (US) revealed that atherosclerotic damage to the carotid arteries was observed in 38 out of 88 patients with systemic sclerosis (SSc), accounting for 43.1% of the total number of patients examined. This included two types of changes: intima-media complex (IMC) thickening in 17 patients (19.3%) and the presence of atherosclerotic plaques (AP) in 21 patients (23.8%). The mean IMC thickness in SSc patients was 0.77±0.01 mm for the average thickness and 0.10±0.03 mm for the maximum thickness. In the control group, these values were 0.70±0.01 mm and 0.83±0.01 mm, respectively (with statistically significant differences for both parameters: p=0.003 for average thickness and p=0.001 for maximum thickness). When comparing the frequency of atherosclerotic changes between SSc patients and the control group, it was found that AP, as well as the combination of IMC thickening and AP, occurred significantly more often in SSc patients, indicating an increased risk of atherosclerosis in this group. The risk of developing atherosclerotic damage to the carotid arteries in SSc patients was assessed as 1.47, confirming the high risk of atherosclerosis and vascular complications in patients with systemic sclerosis.

Conclusions. The study results confirm that patients with SSc experience accelerated development of atherosclerotic damage to the carotid arteries compared to the control group. This highlights the need for regular monitoring of vascular health in SSc patients to ensure timely detection of atherosclerotic changes. Additionally, the findings emphasize the need for active prevention and treatment of atherosclerosis in this patient population, as they are at high cardiovascular risk. It is important to adopt a comprehensive approach to

treatment, including monitoring vascular condition, correcting risk factors, and providing timely pharmacological therapy. Therefore, implementing measures for the prevention of cardiovascular diseases in patients with systemic sclerosis, as well as in other high cardiovascular mortality risk groups, is an essential component of a strategy aimed at reducing mortality and improving the quality of life for these patients.

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