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THE IMPACT OF SEQUELAE OF COVID-19 ON THE COURSE OF ANKYLOSING SPONDYLITIS

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ABSTRACT

Purpose. The purpose of the research was to study the clinical features of the course of ankylosing spondylitis: functional activity, dynamics of inflammation markers and other disorders in patients in the post COVID period. **Materials and methods.** The research included 50 patients with ankylosing spondylitis who had undergone COVID-19 and 20 patients who did not have a history of COVID-19. All patients underwent an assessment on the BASDAI, BASFI, ASDAS, VAS (pain) scales, as well as biochemical, immunological, instrumental (X-ray, MRI of the pelvis and spine, ECG, ECHOCG) investigations. **Results.** High indices of Lansbury, BASDAI, BASFI, ASDAS and VAS scales were noted in the main group than in the control, which indicates the severity of functional disorders. In the majority of patients of main group bilateral sacroiliitis, enthesopathies, and disorders of cardiovascular function (disturbances of myocardial excitability, electrical conduction, damage of valves, an increase size of chambers) were revealed. **Conclusions.** A direct negative effect of the postponed coronavirus infection on the course of ankylosing spondylitis has been established: the resistance of the disease activity, more pronounced violations of functional activity, as well as disorders of the cardiovascular system.

Key words: ankylosing spondylitis, COVID-19, functional activity

INTRODUCTION

Ankylosing spondylitis (AS) is an autoimmune inflammatory disease with varying degrees of damage to joints, entheses, spine, skin and internal organs. The leading symptoms of the disease are chronic pain in the back and joints, morning stiffness. Since the end of 2019, the coronavirus infection (COVID-19) outbreak has caused serious concern around the world [4]. In the early stage of the

pandemic, there was a sharp increase in the incidence of rheumatic autoimmune diseases, in particular the ankylosing spondylitis in patients with COVID-19. Penetrating into various organs and tissues, coronavirus infection leads to endothelial dysfunction, which is the trigger for the development of vascular disorders, including thrombosis [3]. Along with endothelial dysfunction, coronavirus infection triggers autoimmune mechanisms, which underlie the development of hemolytic anemias, immune thrombocytopenias, and systemic diseases.

In recent years, numerous studies have been carried out in the field of studying the influence of a new coronavirus infection on the clinical course of ankylosing spondylitis. In turn, coronavirus infection provokes the development of new clinical manifestations of AS. Given the comorbidity and susceptibility to frequent hospitalizations of patients with AS and postponed coronavirus infection, it is necessary to closely monitor the dynamics of their clinical condition and prevent the development of adverse complications.

MATERIALS and RESEARCH METHODS

We studied 70 patients with ankylosing spondyloarthritis, which were divided into 2 groups. The main group included 50 patients with AS who underwent COVID-19 at the age of 20-45 years, of which 8 women (16%) and 42 men (84%). The average age of the patients was 38.4 ± 1.2 years. The average duration of the disease was 8.3 ± 1.1 years. The control group included 20 patients with AS who did not have coronavirus infection in anamnesis. The average age of the patients was 36 ± 1.8 years; the average duration of the disease was 9.3 ± 1.1 years.

All patients were diagnosed with AS in accordance with the AS criteria. The exclusion criteria were clinical manifestations of coronary artery disease, stroke, high hypertension. Confirmation of the transferred coronavirus infection was the results of a quantitative analysis of IgG to SARS CoV-2 carried out by ELISA, as well as a study of a nasopharyngeal smear by PCR.

All patients underwent standard laboratory and instrumental methods for the diagnosis of AS. In an objective study tests were carried out by Otto-Schober, Thomayer, Kushelevsky 1, 2, 3. Clinical signs of disease activity were also assessed, such as the time of morning stiffness, the severity of the pain syndrome, the Lansbury index, the VAS score, and the BASDAI, ASDAS, BASFI questionnaire was also carried out. Patients underwent X-ray examination of peripheral joints, sacroiliac and vertebral joints (apparatus "Multix-Compact-Siemens", Germany), ECG, echocardiography ("Acuson-Aspen-Siemens", Germany, "Envisor-C-Philips", Netherlands). The inflammation markers such as ESR values, levels of C-reactive protein, small circulating immune complexes were taken into account.

Statistical processing of the material was carried out using standard programs.

RESULTS

In the study, the largest share of high and moderate disease activity occurred in the main observation group and amounted to 9 and 39%, respectively, while in the control group, patients with high disease activity were not found, and 15% of patients in this group were in remission. The data indicate the persistence of disease activity in the postcoid period.

Comparative characteristics of the assessment of the scales, as well as clinical and laboratory data of patients in both groups showed high indices of Lansbury, BASDAI, BASFI, ASDAS and VAS scales in the main group than in the control group: 39.2 ± 1.4 , 6.2 ± 0.8 and 3.8 ± 0.7 , 5.8 ± 0.7 and 17.3 ± 1.1 , 2.4 ± 0.7 , 3.2 ± 0.9 and 1.8 ± 0.4 , respectively which indicates the severity of functional disorders. In 73.4% of the examined patients bilateral sacroiliitis was revealed, enthesopathies - in 96.1%, changes in the heart (disturbances of myocardial excitability, electrical conduction, valve damage, an increase in the size of the chambers) were detected in 68.4% of cases, 48, 3% of which account for the main group of patients.

ESR and C-reactive protein indices in the study and control groups were 47.3 ± 2.1 and 22.5 ± 1.6 , 28.6 ± 3.2 and 14.3 ± 2.1 , respectively. The values of the indices and laboratory parameters are shown in Table 1.

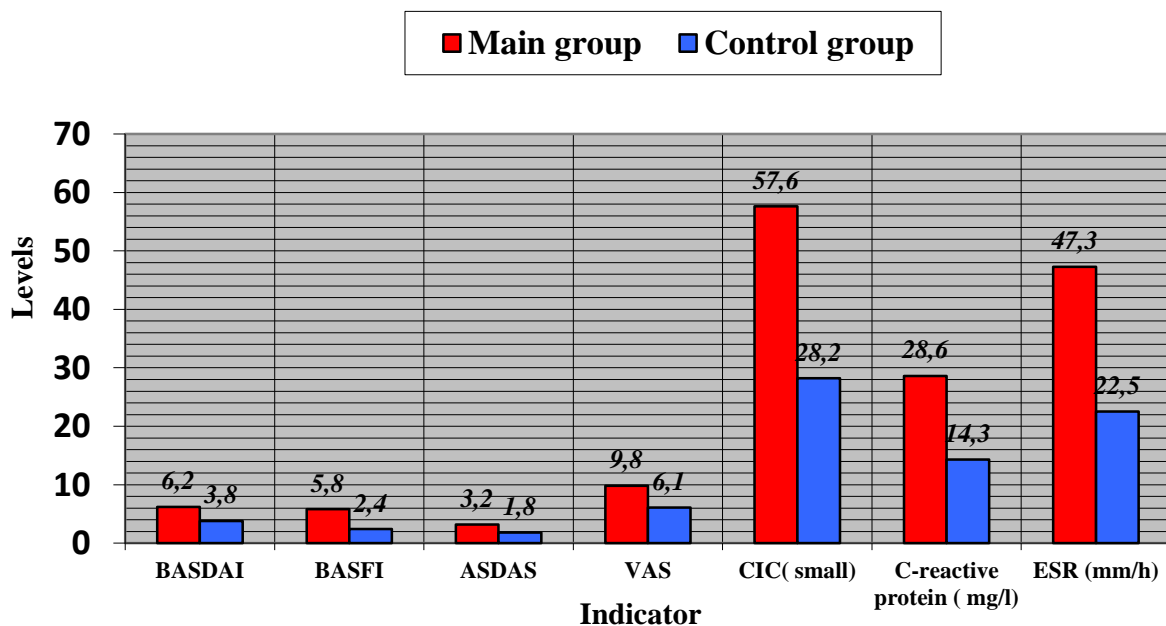
Table 1.
Clinical characteristics of indicators of the course of AS in patients of the main and control groups

Criteria	Main group(n=50)	Control group (n=20)
Men	42 (84%)	16 (80%)
Women	8 (16%)	4 (20%)
Activity (by ESR)		
Minimum	4(8%)	9 (45%)
Middle	39 (78%)	8 (40%)
High	9(1,8%)	-
Remission	-	3 (15%)
C-reactive protein (mg/l)	$28,6 \pm 3,2$	$14,3 \pm 2,1$
ESR (mm/h)	$47,3 \pm 2,1^*$	$22,5 \pm 1,6$
CIC (small, connected with IgG, units)	$57,6 \pm 1,8^*$	$28,2 \pm 1,3$
VAS, sm	$9,80 \pm 1,6$	$6,1 \pm 0,6$
HAQ	$1,8 \pm 0,6$	$0,8 \pm 0,3$
BASDAI	$6,2 \pm 0,8^*$	$3,8 \pm 0,7$
BASFI	$5,8 \pm 0,7^*$	$2,4 \pm 0,7$
ASDAS (by ESR)	$3,2 \pm 0,9$	$1,8 \pm 0,4$
Cardiovascular disorders	$48,3\%^*$	$20,1\%$
Enthesopathies	$7,6\%$	$2,5\%$

Note: * - significance of difference between indices of main and control groups, $p < 0.05$.

To assess the activity of the disease, we determined the levels of small CICs, which showed the highest results in the main group and confirmed the high level of the inflammatory process in patients who have undergone coronavirus infection. Thus, in the main group, the levels of small CECs showed 57.5 ± 1.8 , while in the control group their level was 28.2 ± 1.3 . Thus, the data obtained indicate a high level of inflammation in AS patients who have undergone coronavirus infection.

Graph 1. Comparative characteristics of scales, indices and blood levels of patients of the main and control groups



DISCUSSION

Based on the results obtained in our study, patients with ankylosing spondyloarthritis who underwent COVID-19 showed persistent activity of the underlying disease, as well as a significant decrease in functional activity. In addition, these patients also had a pathology of the cardiovascular system, which manifested itself in the form of arrhythmias, conduction disturbances, and metabolic disturbances. Thus, coronavirus infection has a direct negative impact on the course of autoimmune diseases, leading to the development of adverse complications.

CONCLUSIONS

1. Coronavirus infection has a direct effect on the triggering of autoimmune mechanisms, which, in turn, lead to an exacerbation of rheumatic diseases and the persistence of the activity of the process.

2. A direct negative effect of the postponed coronavirus infection on the course of ankylosing spondyloarthritis was established: a higher activity of the

disease, which was confirmed by the BASDAI and ASDAS indices, as well as more pronounced impairments in functional activity, confirmed by the BASFI index. There was also a pathology of the cardiovascular system, which was manifested by impaired excitability, myocardial conduction, damage to the valve apparatus and rhythm disturbances. An increase in the levels of small CECs, ESR and C-reactive protein indices confirmed a higher degree of disease activity and inflammatory processes in AS patients who had undergone COVID-19.

3. It is necessary to further study the mechanisms of systemic inflammation in patients with ankylosing spondyloarthritis who have undergone COVID-19 and to develop an algorithm for treatment and prophylactic measures in order to prevent the development of adverse complications.

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