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# ARTERIAL HYPERTENSION IN PATIENTS WITH ANKYLOSING SPONDYLITIS AND PSORIATIC ARTHRITIS

**Abstract:**The purpose of this work is to evaluate the occurrence of arterial hypertension (AH) and the frequency of new cases of its occurrence in patients with ankylosing spondylitis (AS) and psoriatic arthritis (PsA). Materials and methods. The data from a single-stage survey of patients with AS (n = 159) and PsA (n = 85) were analyzed. Another part of the work was the analysis of data from a 10-year prospective follow-up patients with AS (n = 278) and PsA (n = 109) were followed. The patient data were compared with the results of the examination of healthy individuals (n = 150). The comparison of individuals from three groups by cardiovascular risk factors was performed. Results. According to the simultaneous analysis, the incidence of hypertension in AS and PsA was 48.7% and 67.5%, respectively (p = 0.03). Relative risk (RR) of hypertension in patients AS compared with healthy individuals was 2.22 (95% CI 1.59–3.1), the odds ratio (OR) was 3.34 (95% CI 2.1–5.3). The risk of hypertension in patients with PsA compared with people without spondyloarthritis (RR) was 3.08 (95% CI 2.19–4.03). Conclusions. The risk of hypertension in patients with AS and PsA exceeds the risk of hypertension in healthy individuals. The incidence of hypertension and the frequency of new cases in PsA are higher than in AS. The number of new cases of hypertension increases over time in such a way that 10 years after diagnosis, every second patient has AS/PsA without cardiovascular diseases is at risk of hypertension.

**Key words:**arterial hypertension, cardiovascular risk, ankylosing spondylitis, ankylosing spondylitis, psoriatic arthritis

## INTRODUCTION

Cardiovascular diseases are the main cause of death in patients with the most common spondyloarthritis — ankylosing spondylitis (AS) and psoriatic arthritis (PsA). Despite the appearance in 2015 of the European Recommendations for monitoring cardiovascular diseases in active AS, many issues related to the pathology of the cardiovascular system in spondyloarthritis need further development. In particular, it is still insufficient The structure of cardiovascular morbidity and mortality in patients with AS and PsA has been studied. The available data are contradictory and do not provide an answer to the question of whether there are patterns in the development of damage to the cardiovascular system in spondyloarthritis that distinguish them from the general population. If such patterns exist, it is unclear whether they are common to the entire group of spondyloarthritis or whether each nosological form within the group has individual characteristics. The contradictions of the available data are demonstrated by the study of S. Brophy and co-authors (2012), which showed the absence of an increase in the frequency of fatal and nonfatal myocardial infarctions and cerebral infarctions in patients with AS and contradicts the data of S. Han et al. (2006) and C. Haroon et al. (2015), who showed an increased risk of cardiovascular events, including fatal ones, in AS. Similarly, the occurrence of cardiovascular risk factors in various diseases has been poorly studied. spondyloarthritis. A number of studies demonstrate the absence of an increase in the number of cases of arterial

hypertension (AH) in AS compared with the general population, some authors, on the contrary, found an increase in the incidence of hypertension in Ankylosing spondylitis. Thus, the study of the patterns of occurrence of cardiovascular diseases in spondyloarthritis remains an urgent problem. The aim of this work was to assess the incidence of hypertension and the frequency of new cases of its occurrence in patients with AS and PsA.

## MATERIALS AND METHODS OF RESEARCH

The study included patients with AS who met the modified New York criteria for AS and patients with PsA who met the CASPAR criteria for PsA (Classification Criteria of Psoriatic Arthritis, 2006). Volunteers without AS, PsA, and cardiovascular diseases formed a comparison group. In a single—stage analysis, 442 cases were examined - 200 medical histories (100 patients with AS and 100 patients with PsA), 242 patients (156 patients with AS and 85 patients with PsA) were interviewed. Of the 676 patients in the PROGRESS study included initially, 363 patients were observed He was at the center for 10 years, of which 238 patients were diagnosed with AS, 109 with PsA. 16 patients simultaneously met the modified New York criteria for AS (1984) and the CASPAR criteria for PsA (2006), therefore their data were analyzed separately and are not presented in this work. The average age of patients with AS who provided information for a one-step analysis (n = 156), was 42.57 ± 12.14 years, the duration of the disease was 13.38 ± 9.77 years, 70 (44.8%) women/86 (55.2%) men. The average age of patients with PsA included in the single-stage The analysis (n = 85) was 43.47 ± 11.1 years, the duration of the disease was 10.6 ± 7.23 years, 52 (61.1%) women/33 (38.9%) men.. All patients nonsteroidal anti-inflammatory drugs (NSAIDs) were taken with AS and PsA during the 10-year follow-up period, the NSAID intake index ASAS (Assessment of SpondyloarthritisInternational Society) for the specified period of interest was 40%, that is, on average, patients took 40% of the maximum possible total dose for a given period over 10 years. 35 (14.1%) patients with AS took methotrexate at a dose of 7.5–25 mg per week, 124 (52.1%) — sulfasalazine at a dose of 2.0–3.0 g / day, 5 (2.1%) — leflunomide 20 mg / day, 5 (2.1%) — combination therapy with methotrexate and sulfasalazine, 54 (22.8%) — oral glucocorticoids at a dose of 7.5–10 mg / day in prednisolone equivalent. 35 (32.1%) PsA patients took glucocorticoids orally at 7.5–10 mg/day, 75 (68.8%) — methotrexate at a dose of 7.5–25 mg per week, 24 (22%) — sulfasalazine at 2.0–3.0 g/day, 6 (5.5%)— leflunomide at 20 mg/day, 5 (4.58%) — combination therapy with methotrexate and sulfasalazine (total 109 people). The statistical analysis was performed using the application software packages Statistica SPSS17 and Statistica GraphPadPrism. The nature of the data distribution was assessed graphically and using the Kolmogorov–Smirnov and Shapiro–Wilk criteria, the distribution was considered normal at $p > 0.05$. The description of features with a normal distribution is presented in the form of M ± SD, where M is the arithmetic mean, SD is the standard deviation; for features with a distribution other than normal, the results are presented as Me [Q1; Q3], where Me is the median, Q1 and Q3 are the first and third quartiles. To compare two groups with a normal distribution of a quantitative trait, the Student's t-test for independent groups was determined (taking into account the type of variance of the trait determined by the Levene method), and a paired t-test for dependent groups. When the data distribution was different from normal, nonparametric methods were used: the Mann–Whitney criterion, the Wald criterion–Wolfowitz criterion $\chi$ 2, Wilcoxon criterion, sign criterion. Comparison of the frequency of hypertension They were studied using the Mantel–Cox method (logrank Mantel–Cox test). The relative risk of hypertension and the odds ratio for hypertension were calculated for different groups of patients.

## THE RESULTS AND THEIR DISCUSSION

According to extracts from medical documentation, hypertension was diagnosed in 42 (42%) patients with AS (n = 100) and in 44 (56%) patients with PsA (n = 100), p = 0.02. According to a self-completed questionnaire on the study of concomitant diseases (Self-Administered Co-Morbidity Questionnaire/F6V1) an increase in blood pressure was noted in 76 (48.7%) patients with AS (n = 156) and 54 (63.5%) patients with PsA (n = 85), p = 0.03. The data obtained from medical records and by interviewing patients regarding the occurrence of hypertension in AS and PsA did not differ (p > 0.05). Comparison of the frequency of occurrence Hypertension using the Mantel–Cox method (logrank Mantel–Cox test) showed significant differences between the indices of patients with AS, PsA and those without spondyloarthritis (p < 0.0001). The relative risk (RR) of hypertension in patients with AS compared with healthy individuals was 2.22 (95% CI 1.59–3.1), odds ratio (OR) — 3.34 (95% CI 2.1–5.3). Relative risk of development Hypertension in patients with PsA compared with those without spondyloarthritis (RR) was 3.08 (95% CI 2.19–4.03). When plotting survival curves for hypertension in spondyloarthritis, it was found that 8 years from the moment of onset of PsA symptoms (10 years from the moment of diagnosis) and 23 years from the moment of the first symptoms of AS (10 years from diagnosis) is the median survival rate of the trait, that is, 10 years after diagnosis in every second patient. with AS or PsA without cardiovascular diseases a history of hypertension will be recorded. Dysregulation of blood pressure is an independent risk factor for fatal and nonfatal cardiovascular events both in the general population and in certain nosological forms associated with an increased risk of cardiovascular pathology. A number of studies have shown that there is a higher incidence of hypertension among patients with AS than in the general population. Similar patterns have not been identified in other studies. Data on cardiovascular pathology In PsA, they are more homogeneous, and the fact of an increase in the incidence of hypertension has not been refuted in any of the studies known to us. Conflicting data on the severity of cardiovascular pathology in AS make it difficult to understand whether the presence of spondyloarthritis should be considered as an additional factor in the development of hypertension and a cardiovascular risk factor. It seems to us that the existing contradictions are determined, among other things, by the peculiarities of the analyzed patient samples. Interestingly, in studies that have shown an increase in the occurrence of cardiovascular risk factors in AS, approximately 10% of the patients were diagnosed with the disease Crohn's disease, ulcerative colitis, or psoriasis, which are recognized as factors independently associated with hypertension and metabolic syndrome. If the presence of psoriasis is not taken into account, it is possible to underestimate the risk of developing cardiovascular diseases in the studied population and obtain false positive results. In our previously published study, we showed differences in the occurrence of cardiovascular outcomes in patients with AS with and without psoriasis. The advantage of this work was the exclusion of "intersections" between AS and PsA, which made it possible to identify the features of the appearance of hypertension in these diseases, the main of which was the detection of the predominance of hypertension in PsA with early destabilization of blood pressure in most patients. Thus, when assessing the risk of hypertension, it does not matter which nosological form of spondyloarthritis the patient went to the doctor with. This postulate is indirectly confirmed by the data of this work, which showed that in patients with PsA, hypertension is more common than for people with AU. Moreover, the differences between the incidence of hypertension in spondyloarthritis persist for a long time (at least 10 years, according to our data). Greater risk of hypertension in PsA than in AS is consistent with data on a higher risk of metabolic syndrome in PsA and the presence of endothelial dysfunction in PsA, the severity of which is correlated with the activity of arthritis. The data on a lower risk of hypertension in AS are in good agreement with the results of studies

that showed no increase in vascular wall stiffness in AS. And if in the work A. Arida and co-authors (2015) established the absence of an increase in vascular wall stiffness only in patients with low AS activity, while as in patients with PsA, the presence of endothelial dysfunction has been shown in many studies, which is consistent with the results of the present work. Another advantage of this work was the long period of patient follow-up, which allowed us to show the change in the number of AH patients with spondyloarthritis in dynamics and calculate the time to reach the median incidence of AH in spondyloarthritis . Interestingly, the estimated time frame for reaching the median (10 years after diagnosis) lagged somewhat behind the actual time frame for achieving it. This may be due, among other things, to the peculiarities of the treatment of the examined patients. It is shown that all patients with spondyloarthritis received NSAIDs, and some patients use glucocorticoids, drugs that are associated with increased blood pressure. At the same time, modern research shows that reducing chronic inflammation and pain can positively affect blood pressure levels and cardiovascular outcomes in people with chronic diseases of the musculoskeletal system.

**CONCLUSIONS**

1. The risk of hypertension in patients with AS and PsA exceeds the risk of hypertension in healthy individuals.

2. The incidence of hypertension and the frequency of new cases in PsA are higher than in AS.

3. The number of new cases of hypertension in AS and PsA increases over time, so that 10 years after diagnosis, every second patient with these spondyloarthritis without cardiovascular diseases will have hypertension.

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