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Features Of Kidney Damage at Patients with Ankylosing Spondiloarthritis

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Abstract. Kidney damage is a fairly common extra-articular manifestation of ankylosing spondiloarthritis (AS) and occurs with a frequency of 0.5 to 30% according to various clinical and epidemiological studies. However, the actual prevalence of renal disease in AS remains unspecified. This is largely due to the difficulties in verifying the diagnosis of "drug- nephropathy" in patients with a high level of comorbid pathology, in particular, arterial hypertension, metabolic syndrome and diabetes mellitus, which cause chronic kidney disease. The main causes of kidney damage directly related to AS are chronic autoimmune inflammation and drug-induced lesions associated with anti-inflammatory therapy. It has been proven that as the duration of AS increases, the incidence of CKD increases and this may be a hidden risk factor for an increase in mortality in these patients. In this context, the role of subclinical changes in the kidney is increasing, which may reflect the initial stages of CKD or precede it. The basis of the work was the results of a comprehensive clinical, instrumental and laboratory examination of 60 patients with AS.

Key words: ankylosing spondiloarthritis, inflammation, kidney damage, microalbuminuria, proteinuria, glomerular filtration rate.

Inroduction

Ankylosing spondiloarthritis (AS) is a chronic systemic inflammatory disease of unknown etiology, which is often characterized by frequent entheses (entesitis) and peripheral joints (arthritis), spinal cord (spondylitis), hip joints (sacroileitis) [1,2]. The disease is characterized by its development at a young age, chronic development, limited ability to work in some parts of the patient, which determines its social significance. Subsequently, evidence for the key role of this specific antigen in the development of clinical manifestations of AS was identified [2,3]. Among rheumatic diseases, including ankylosing spondylitis (AS), nephrological pathology occupies a special place. The problem of kidney injury in rheumatic diseases is interdisciplinary. The different frequency of renal injury in ankylosing spondyloarthritis (AS) is 5-20%, the most common types of renal injury are secondary renal amyloidosis (62%), IgA nephropathy (29%), mesangioproliferative glomerulonephritis (5%), focal segmental glomerulus 1%) and focal proliferative glomerulonephritis (1%), NSAID-nephropathy (2%), less – nephrolithiasis [4]. Specific symptoms of kidney damage (microhematuria, microalbuminuria, increased serum creatinine) are very common - up to 35%. It is necessary to distinguish systemic manifestations in patients with comorbid diseases. An individual approach is required for each patient [5]. The main reason for the observation of CKD in these patients is related to long-term persistent inflammation and possibly long-term use of certain medications. Rheumatic diseases can be accompanied by a wide range of concomitant diseases. further study of them and development of recommendations on examination and treatment tactics of these patients is a topical issue. Data on the extent and nature of kidney damage in patients with spondyloarthritis (SpA) are unclear [6,7].

Aim of the study.

To study the prevalence of kidney damage in patients with ankylosing spondiloarthritis (AS), to identify the main risk factors for the development of renal dysfunction.

Material and Research Methods

The study was open comparative randomized. The basis of the work was the results of a comprehensive clinical, instrumental and laboratory examination of 60 patients with AS (40 men and 20 women). The age of patients in the clinical group ranged from 20 to 68 years, averaging 50.2 ± 1.1 years.

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Criteria for inclusion of patients in the study were: age 18 years and older, verified diagnosis of AS in accordance with the criteria of the American College of Rheumatology (ACR-EULAR, 2010), informed consent. The exclusion criteria were clinically significant diseases of the internal organs - moderate and severe forms of chronic circulatory failure, organic kidney pathology not associated with AS, liver failure, diabetes mellitus, chronic kidney disease (CKD) stage 4-5 (GFR ≤ 29 ml / min / 1.73 m2). Patients of the clinical group, depending on the presence or absence of clinical signs of kidney damage, were divided into two groups. Group 1 comprised 34 (57.0%) patients who did not have renal dysfunction, and group 2 consisted of 26 (43.0%) patients with renal dysfunction. Within the 2nd group among patients with AS, subgroups were distinguished with different involvement of the kidneys in the pathological process: depending on the value of glomerular filtration rate (GFR) (GFR ≥ 90 ml / min / 1.73 m2; GFR 60-89 ml / min / 1 , 73 m2 and GFR 30-59 ml / min / 1.73 m2), the presence or absence of microalbuminuria (MAU), proteinuria, the level of excretion of albumin and protein in the urine. The study of the functional state of the kidneys included a general urine analysis, urinalysis according to the methodology of Zimnitsky, Kakovsky-Addis; determination of glomerular filtration rate according to Cockcroft-Gault and MDRD (Modification of Diet in Renal Disease Study) formulas. An ultrasound examination of the kidneys was also performed, the presence and severity of MAU, proteinuria were assessed. During a biochemical blood test, the determination of total protein, albumin, creatinine, uric acid, the ratio of albumin / creatinine, total cholesterol, glucose was determined. The characteristics of patients in the study group are presented in table No. 1.

Characteristics of patients with rheumatoid arthritis

Table 1

	Total	Gender		Average age Me	Average duration of diseases Me
Groups		M	F		
Patients AS with kidney damage	26	18	8	52 ±2.4 P<0.05	9,29±0.4 P<0.05
Patients AS without kidney damage	34	22	12	50±2.5 P <0.05	8.9±0.5 P <0.05
Control healthy	20	15	5	50,3±2.2	-

Note: p-differences

Most were diagnosed with a late stage of the disease - 36 (60%), early - in 24 (40%) patients. The group was dominated by patients with high AS activity, the average value of BASDAI - 5.91 (5.20 - 6.58).

The main goal of our work was to study the prevalence of kidney damage in patients with rheumatoid arthritis (AS), to identify the main risk factors for the development of renal dysfunction.

Statistical processing was carried out on a DELL personal computer using the Microsoft Office Excel - 2010 software package, including the use of built-in statistical processing functions. We used the methods of traditional variational parametric and nonparametric statistics with the calculation of the arithmetic mean of the studied indicator (M), standard error of the mean (m), relative values (frequency,%), the statistical significance of the measurements when comparing the average values was determined by the Student criterion (t) with the calculation error probability (p). For statistically significant changes, a confidence level of p <0.05 was taken.

Discussion.

Among 60 patients of the clinical group, 34 (57%) patients did not show kidney damage (group 1). Accordingly, 26 (43%) patients were included in the 2 nd group. Among patients of the 2nd group, among kidney damage with microalbuminuria (MAU), 16 (61%) patients were identified: in 4 patients on the basis of persistent MAU, and in one patient on the basis of persistent urinary syndrome in the form of erythrocyturia. In AS, various clinical and morphological variants of renal pathology are described (mesangio-proliferative glomerulonephritis, tubulo-interstitial nephritis, amyloidosis) [9, 10], most of which

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are accompanied by the development of proteinuria in the debut, which can remain the main diagnostic sign for a long time. Early manifestations of functional renal impairment, especially with moderate severity of proteinuria, do not always attract the attention of clinicians, while the progression of CKD in AS can be rapid, especially in old age and in association with cardiovascular disease [8].

A slight decrease in GFR (60-89 ml / min / 1.73 sq. m) was observed in 16 (61%) patients with AS with kidney damage. 10 (39%) patients with nephropathy had a moderate decrease in GFR in the range of 30-59 ml / min / 1.73 sq. m. Normal or elevated GFR (90 or more ml / min / 1.73 sq. m) was determined in 3 patients of the 2nd group. Noteworthy is the small proportion of patients with AS with normal or elevated GFR (90 or more ml / min / 1.73 sq. m) among patients of the 2nd group with kidney damage. In general, the MAU group was observed in 17 (28%), and proteinuria was detected in 10 (16%) patients. In the 2nd group of patients, MAU was observed in 4 patients with a slight decrease in GFR, in 10 patients with a moderate decrease in GFR, and proteinuria in 1 patient with a 2nd and 10 patients with kidney damage. In total, in the 2nd group, MAU was detected in 18 (69%), and proteinuria in 8 (31%) patients.

The average creatinine level in patients with AS was 82.6 ± 1.6 μmol / L, the swing range was from 61 to 135 μmol / L. Hypercreatinemia (in men above 115 μmol / L, in women above 97 μmol / L) was observed in 8 cases (13%). In patients with AS, blood urea ranged from 2.9 to 13.7 mmol / L, averaging 6.4 ± 0.8 mmol / L. An increase in urea above normal (8.3 mmol / L) was detected in 8 patients (13%).

At the next stage of the study, the main indicators reflecting the functional state of the kidneys were analysed separately in groups with the presence or absence of kidney damage.

In patients of the 2nd group, with the addition of kidney damage, there was a decrease in GFR by 48.7% ($p < 0.001$), the level of daily proteinuria increased by 863.5 times ($p < 0.001$), and the content of creatinine by 9.8% ($p < 0.05$).

In a preliminary assessment of the specific gravity of urine according to the results of a general analysis, it was found that in the group, the relative density of urine ranged from 1005 to 1030, the average value was 1018.2 ± 1.2. In the 1st group, the relative density of urine varied from 1005 to 1030, in the 2nd group - from 1005 to 1020. The average specific gravity of urine in patients of the 1st group was 1016.9 ± 0.56, of the 2nd group - 1018.7 ± 0.59. The average value of the relative density of urine in patients of the 1st and 2nd groups, as well as in the clinical group in general, was slightly less than the lower limit of the norm. According to the results of the Zimnitsky test, it was found that in the whole group, as well as in the 1st group, the concentration and water excretion ability of the kidneys was normal. In patients of the 2nd group, the concentration ability of the kidneys was impaired, since the relative density of urine was lower than 1018. In patients of the 2nd group, the concentration index was lower by 35.7% compared with the 1st group ($p < 0.001$).

Research Results.

Thus, the group of patients with signs of kidney damage included older patients with high activity, a disease duration of more than 5 years, a late clinical stage, and the seropositive nature of AS. Early detection of kidney damage will provide timely intervention and a decrease in the rate of progression of kidney damage, therefore, the incidence of CKD is reduced.

According to modern concepts, the presence of protein in the urine is considered as the most important predictor of the development of functional renal impairment and increased mortality, with various pathologies, including AS [10]. According to some researchers, microalbuminuria and proteinuria with normal or reduced kidney function can develop in the early stages of the course of AS, at the same time, its prognostic value may be ambiguous due to the variety of nosologically options for kidney damage. According to modern concepts, renal dysfunction lasting more than three months (the so-called chronic kidney disease), including without a specific nosologically diagnosis, it is considered as the most important prognostic factor requiring correction of therapeutic tactics, with various pathologies in the general population.

Thus, the determination of microalbuminuria can be a simple and sensitive marker for early renal damage, including drug-induced damage. A large amount of data on the most important prognostic significance of the determination of microalbuminuria (proteinuria) as an additional marker of functional renal impairment has been taken into account recently at the international level, which was reflected in the

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new classification of chronic kidney disease, in which the division at the stage was performed not only by assessing glomerular velocity filtration, but the significance of microalbuminuria (proteinuria).

So, patients with AS are a group of increased risk of renal pathology, the likelihood of developing which increases with a prolonged and active course of AS. Clinical symptoms of renal dysfunction in patients with AS with high activity and duration of the underlying disease, as well as in the detection of arterial hypertension and dyslipidemia, should be the basis for active clinical observation of patients. This approach will direct the efforts of clinicians in the timely treatment of kidney pathology in patients with RA, which will extend the life of patients and improve its quality.

Conclusions:

1. Among patients with AS, the prevalence of kidney damage is 27 % and is manifested by a decrease in GFR of less than 90 ml / min / 1.73 m2 in 21 %, MAU in 28%, proteinuria in 16%, hypercreatinemia and increased urea.
2. Risk factors for renal complications were established: age, high activity and duration of the disease, seropositive nature of AS.
3. In patients with AS, the development of kidney damage and the severity of its manifestations are determined by the duration and activity of the underlying disease and age.

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