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Reasons for the Development of Morphostructural Changes in Kidney Cells in Patients with Rheumatoid Arthritis

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Annotation: The scientific review is intended for one of the urgent problems of modern medicine - kidney damage in rheumatoid arthritis. The issues of prevalence and risk factors of chronic kidney disease are considered. The kidneys are affected in rheumatoid arthritis more often than it is diagnosed. As a result, early diagnosis of kidney damage in patients with rheumatoid arthritis has an important clinical and prognostic value. In rheumatoid arthritis, the occurrence of chronic kidney disease depends primarily on the duration of the disease and the nature of the inflammatory process. A higher incidence of RA among first-degree relatives of patients was established than in the general population. These data are fully confirmed at the present time. The problem of kidney damage in rheumatoid arthritis is poorly understood and requires further research.

Keywords: rheumatoid arthritis, chronic kidney disease, glomerulonephritis, amyloidosis.

Rheumatic diseases are the oldest human pathology, and are considered the most common ailments of the XXI century. In recent decades, there has been some progress in the field of theoretical and clinical rheumatology. According to E.A. Galushko and E.L. Nasonov's rheumatic diseases include more than 80 diseases and syndromes [31]. Rheumatoid arthritis (RA) is an autoimmune disease characterized by the development of chronic destructive polyarthritis with frequent involvement in tological process of other systems. Extra-articular systemic lesions in RA can have a serious impact on the prognosis of the disease [8, 39].

Large studies conducted in recent years have demonstrated the association of RA with a high risk of chronic kidney disease (CKD) and cardiovascular complications, which is associated with an increase in mortality in this category of patients [9, 27,18]. The spectrum of renal pathology underlying CKD in RA is quite wide. Secondary amyloidosis for many years occupied the main position among the variants of nephropathy in patients with RA [23,44]. According to some studies, there is a tendency to change the structure of kidney damage in RA [5], given the use of highly effective therapy regimens, including genetically engineered drugs, which is an additional prerequisite for studying this category of patients.

Earlier in the works of V.A. Nasonova noted that women everywhere suffer from RA more often than men (4:1). Moreover, in women, the incidence of RA increases with age [40]. In addition, a higher incidence of RA was found among first-degree relatives of patients than in the general population. These data are fully confirmed at present [3]. The formation of nephropathy in RA is multifactorial, which is represented by the variety of their clinical and morphological variants with minor, nonspecific changes in urine tests.

The course of rheumatoid nephropathy, as well as other chronic kidney diseases, is progressive in nature with the development of nephrosclerosis and a decrease in the foothold of functioning

nephrons, with an outcome in chronic renal failure, with an extremely unfavorable prognosis, which determines the importance of early diagnosis and treatment of nephropathies in RA. Renal pathology is detected with RA with a high frequency - about 60%, according to different authors [36].

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In patients with RA, various renal diseases can occur: secondary amyloidosis of the kidneys, glomerulonephritis, interstitial nephritis, vasculitis of the renal vessels, nephrosclerosis, and in some cases their combination [30,37]. Etiologically, very conditionally, kidney damage in RA patients can be divided into 2 groups: firstly, nephropathy as one of the extra-articular manifestations or complications of RA itself, for example, renal vascular vasculitis, chronic glomerulonephritis, secondary amyloidosis, and secondly, as a complication of drug therapy R A: analgesic nephropathy (AN), drug-induced glomerulonephritis.

The pathogenesis of such different renal diseases cannot be the same. Vasculitis of the renal vessels and glomerulonephritis are of an immune nature, mainly immunocomplex; in severe cases, signs of an autoimmune process are recorded. The toxic effects of long-term use of NSAIDs on the enzyme systems of renal tubular epithelial cells and interstitium underlie the development of AN. A certain contribution to the progression of chronic kidney disease is made by disturbances in the hemostasis system, endothelial dysfunction [41,43,24], the frequency of exacerbations of the disease, the presence of crescents and the severity of tubulointerstitial changes in the nephrobioptate [21].

Patients with rheumatoid vasculitis of the renal vessels are more likely to have a mild transient decrease in renal function along with transient hematuria suggestive of local inflammation, and severe renal failure is rare [38,1]. The spectrum of renal pathology underlying CKD in RA is quite wide. Secondary amyloidosis for many years occupied the main position among the variants of nephropathy in patients with RA [45,28]. According to some studies, there is a tendency to change the structure of kidney damage in RA [6].

Many researchers have noted that the development of CKD and the severity of its manifestations in RA patients are determined by the duration and activity of the underlying disease, age, the presence of arterial hypertension (AH), lipid metabolism disorders and hyperglycemia [46, 2, 17].The unfavorable prognostic significance of kidney damage in rheumatoid arthritis (RA) has been actively attracting the attention of researchers in recent years [10].Certain clinical variants of kidney involvement in the pathological process in rheumatoid arthritis are observed in most patients [33].

Various variants of kidney damage in rheumatoid arthritis have been described, in particular, glomerulonephritis, amyloidosis, vasculitis, as well as iatrogenic forms (analgesic tubulopathies, membranous nephropathy, etc.) [35,29,32]. It is noteworthy that in real clinical conditions in such patients, morphological verification of renal pathology may not be performed for a long time for a number of objective reasons. Early manifestations of functional renal disorders, especially when they are moderate, do not always attract the attention of clinicians, while the progression of chronic kidney disease (CKD) in RA can be rapid, especially in old age, as well as in association with cardiovascular disease. pathology [11,14].According to some researchers, the development of CKD in RA may be associated with cardiovascular damage to a greater extent than with the activity of RA itself [16].

Currently, the leading pathogenetic mechanism for the development of glomerulo and tubuointerstitial changes in the kidneys is chronic inflammation. In particular, elevated levels of blood C-reactive protein (CRP) in patients with RA cause dysfunction of the glomerular vascular endothelium and trigger the synthesis of pro-inflammatory cytokines. The prognostic significance of an increase in the level of inflammatory markers and a decrease in glomerular filtration rate (GFR) in RA individuals has been noted in a few studies [20,25]. Previously published studies have shown that in RA patients treated with cytokine inhibitors, kidney function remained stable for a long time [19]. According to other data, in RA and renal amyloidosis, therapy with inhibitors of tumor necrosis factor alpha led to a simultaneous decrease in proteinuria [4,7].

The study of the pathogenesis of glomerulonephritis continues, as the existing methods of therapy do not have the desired effectiveness [34,]. The connection of glomerulonephritis with a change in the balance of cytokine synthesis associated with the mechanisms of the immune response has been proven [13,22]. It has been established that cytokines are involved in the regulation of proliferative processes, differentiation, growth, and cell activity [12,26].

Cytokines allow you to regulate the nature and duration of the immune response and inflammation. The quantitative content of cytokines and their ratio reflect the dynamics of the pathological process, correlate with the activity of the disease, which makes it possible to judge the effectiveness of the therapy and predict the outcome of the disease [42].

However, the degree of involvement of cytokines in the development of kidney diseases, including glomerulonephritis, has not been studied enough. Reports on the study of cytokine interactions in glomerulopathies, especially in children, are few, their results are contradictory. Based on the high significance of glomerulonephritis and the significant importance of the immune system in the pathogenesis of this disease, the study of the features of the cytokine profile in immune inflammation in the kidney remains a relevant and promising direction.

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