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A NEW APPROACH TO EARLY DIAGNOSIS OF CHRONIC KIDNEY DISEASE IN THE ELDERLY

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Abstract. *Chronic kidney disease (CKD) is a super-nosological concept that combines a complex of diseases with common pathogenesis, symptoms and outcomes. Pathology affects 13.4% of the population and is 3 times more common in people over 60 years of age than in patients of working age. The incidence of CKD in patients with heart disease is about 26%. Frequent occurrence, irreversible nature, difficulties in treatment and a significant impact on a person's quality of life, all this determines the relevance of the problem in modern nephrology. Risk factors for the development of chronic kidney disease, in addition to kidney disease, are arterial hypertension, diabetes mellitus, atherosclerosis, obesity, metabolic disorders, especially high cholesterol and uric acid in the blood. There are simple and accessible methods for early diagnosis of kidney disease, but in the vast majority of patients the disease is detected at a terminal (final) stage, when the opportunity for effective treatment has already been missed.*

Keywords: *Chronic kidney disease (CKD), arterial hypertension, diabetes mellitus, atherosclerosis, obesity, metabolic diseases, Glomerular filtration rate (GFR).*

Chronic kidney disease (CKD), including. Stages characterized by a persistent decline in glomerular filtration rate (GFR) and therefore associated with the worst long-term prognosis, are increasingly common in the general population, especially among the elderly. The results of large-scale epidemiological studies show that CKD is especially common in older people [1, 2]. Therefore, the relationship between CKD and aging has become the main theme of World Kidney Day 2020 [3].

The sharp increase in the incidence of CKD among representatives of the elderly age group is primarily associated with the prevalence of common risk factors in the population (arterial hypertension, diabetes mellitus, obesity) [4]. A large population-based analysis of NHANES and KEEP, including a total of 32,555 subjects, and a 5%

sample of the Medicaid database (1,236,946 cases) [5] found that a persistent decrease in GFR < 60 mL/min/1.73 m2 and/or albuminuria was significantly more common in people aged 80 years and older, and the number of comorbidities increased. In turn, the number of comorbidities associated with a decrease in estimated GFR increased, and this relationship was particularly pronounced in the elderly. The prognostic risk of CKD in the elderly and senile population is largely due to the lack of complete diagnostic accuracy, especially when only one laboratory indicator characterizing the state of the kidneys is chosen as a guide. [6]

A 5-year follow-up of elderly patients (mean age 83 years) showed that when the initial creatinine level was > 1.1 mg/dL, the mortality rate was significantly higher than in individuals with a serum creatinine level < 1.1 mg/dL (66.7 vs. 34.2%, p = 0.004). Mortality, assessed by the value of endogenous creatinine clearance, on the other hand, did not differ significantly between groups differentiated by the initial level of creatinine, nor did there appear to be any differences in the rate of progression of SCK, assessed by the values creatinine, urea concentration, and also GFR calculated using the MDRD formula. Therefore, the results of this study do not allow us to doubt that the presence of SCK significantly worsens the prognosis of elderly patients, but indicate that focusing only on creatinineemia, making a diagnosis and predicting its course may not be entirely correct. Of course, the optimal methods for assessing GFR in the elderly require further refinement and standardization; one of the most promising is the calculation of this indicator using the SBK-EPI formula based on the results of determining serum creatinine and cystatin C levels [7].

It should be borne in mind that, all other things being equal, complications of almost any disease are most pronounced in elderly patients with SBK and their course is unfavorable. Thus, in particular, it was found that albuminuria and a decrease in estimated GFR in elderly patients with type 2 diabetes are independent predictors of frontal lobe dysfunction of the brain [8]. Elderly patients with SBK have a different worst blood pressure control: as they age, they The frequency of uncontrolled isolated systolic arterial hypertension, which is considered one of the most unfavorable prognostic forms of arterial hypertension, increases. The determining factors of uncontrolled arterial hypertension for this category of patients are also stages 4-5 SBK, obesity, and type 2 diabetes mellitus [9].

It should be noted that in elderly people, kidney diseases that lead to a persistent decrease in GFR are somewhat different from those that play a leading role in the formation of chronic renal failure in young patients. In addition, the course and outcome of SBC in elderly people, as well as the factors that determine them, are characterized by certain features, which, as a rule, lead to a significant deterioration in the prognosis, all other things being equal, including. kidney. Active study of the

nosological features of SBC in the elderly continues. Immunoinflammatory damage to the renal glomeruli, which is clinically manifested by the development of acute or chronic glomerulonephritis, is traditionally casuistically rare in elderly people. [9].

Having examined 57 patients with chronic glomerulonephritis over 60 years of age, they found that in 27 of them (47.4%) the onset was in old age. In 14 patients, kidney damage was isolated, and in 13 it occurred as part of systemic diseases [10].

In the clinical evaluation of glomerular lesions in the elderly, the possibility of their paraneoplastic origin should always be kept in mind; according to R.A., its establishment becomes especially urgent in the development of membranous nephropathy, which is a component [9].

This accounts for almost a third of cases of chronic glomerulonephritis in this age group [11]. In the Czech kidney biopsy registry, membranous nephropathy was the most common (16.8% of patients) [12], therefore, it surpassed diabetic nephropathy and amyloidosis in its contribution to the structure of the causes of nephrotic syndrome in the elderly [13, 14].

In general, membranous nephropathy is one of the most common types of paraneoplastic kidney damage, although it is often very difficult to obtain reliable evidence of the presence of a malignant tumor in a patient due to the impossibility of developing a specific and, at the same time, sufficiently detailed examination program. The results of one of the stages of the large GN-PROGRESS study [15], in which 240 patients with membranous nephropathy (24 of whom had a neoplastic lesion detected during kidney biopsy or within the first year after it) were included, show that this form of chronic glomerulonephritis is associated with a 9.8-fold increase in the incidence of malignant tumors in men and a 12.3-fold increase in women. In paraneoplastic membranous nephropathy, compared with primary nephropathy, a significantly higher intensity of infiltration of the renal glomerulus by inflammatory cells was also found. The presence of 8 or more inflammatory cells in the renal glomerulus reliably indicates the relationship between membranous nephropathy and malignancy: the sensitivity of this test is 92%, specificity - 75%. Patients with paraneoplastic membranous nephropathy were able to achieve a decrease in urinary protein excretion only after achieving remission of the neoplastic process. Predominantly IgG1 and IgG2 deposition in the renal glomeruli is also considered one of the possible signs of paraneoplastic membranous nephropathy. The formation of paraneoplastic glomerulonephritis is associated with the effect on the structures of the renal glomerulus of mediators (antibodies, pro-inflammatory and profibrogenic cytokines) produced by the tumor tissue itself or by immunocompetent cells in response to its growth [16, 17].

Usually, tumors are not found in the renal tissue. Most forms of primary glomerulonephritis are relatively rare in the elderly. The use of immunosuppressive therapy in elderly patients should be based, if possible, on the results of morphological examination of the kidney tissue obtained by biopsy. The complication rate of renal biopsy in the elderly is not higher than in the general population, but taking into account the contraindications to this procedure in patients over 60 years of age, it should be especially strict [18].

Currently, we can clearly state a trend towards an increase in the frequency of kidney biopsies in elderly patients [19]. The rate of deterioration of renal function in chronic glomerulonephritis in the elderly depends not only on its morphological variant, but also on the severity of renal failure, which is often aggravated by concomitant diseases. M. Washioet et al. (1994) analyzed the prognosis of 31 patients with poststreptococcal glomerulonephritis, seven of whom were over 55 years old. Unlike young patients, most of them had arterial hypertension. Renal failure was noted in 4 of 7 elderly patients, while renal function was preserved in all examined individuals under 55 years of age. Thus, chronic glomerulonephritis can develop in elderly people: among its morphological variants, membranous nephropathy predominates. The use of active immunosuppressive therapy in this category of patients should be clearly justified, both in connection with the maximum likelihood of adverse events associated with such treatment, and because of the high risk of malignant tumors, the development of which is often accelerated by the use of glucocorticosteroids and cytostatics.

One of the most common forms of chronic progressive nephropathy in the elderly is chronic pyelonephritis. In older people, purulent forms of this disease are often observed: in men, their frequency reaches 23.3%, in women - 15.9%. The purulent process in the kidneys can spread widely with the subsequent addition of sepsis and bacteremic shock, leading to death. The background of the development of chronic pyelonephritis is often obstruction of the urinary tract by a tumor or nephrolith [21].

Chronic pyelonephritis in the elderly is often not diagnosed or at least its severity is not adequately assessed, which is associated with the minimal severity of the disease and sometimes the absence of typical clinical manifestations of this disease - fever, pain in the lumbar region. These patients have identified a specific. "Cachectic" mask of chronic pyelonephritis in the elderly, a persistent decrease in body weight (up to cachexia) and anemia [21]. Another variant of chronic, mainly tubulointerstitial nephropathy, which is over 60 years old and is not recognized even at the stage of irreversible deterioration of renal function, is kidney damage caused by the abuse of non-narcotic analgesics and / or NSAIDs. The development of analgesic nephropathy

is associated with long-term (at least a year) use of non-narcotic analgesics or non-steroidal anti-inflammatory drugs (NSAIDs) [22].

The greatest risk in terms of the development of analgesic nephropathy is called. chronic pain syndromes - headaches, incl. migraine, joint pain, especially those associated with osteoarthritis, back pain syndrome, persistent abdominal pain, especially observed in elderly and senile people. The habit of self-treatment with NSAIDs and non-narcotic analgesics is usually supplemented by "prophylactic" treatment in the future. These drugs are usually uncontrolled. As a result, the number of NSAIDs and non-narcotic analgesics used for a long time without a doctor's prescription can be significant, especially since most of these drugs are approved for sale without a prescription [23]. The most dangerous in terms of the formation of analgesic dependence are analgesic mixtures containing caffeine and / or codeine (for example, "five", "three") [24, 25]. For a long time, most cases of analgesic nephropathy were associated only with taking phenacetin; In some countries (Australia, New Zealand), after the ban on this drug, a decrease in the prevalence of this SBC was noted [26]. However, in some countries, despite the withdrawal of phenacetin over the past two decades, the contribution of analgesic kidney damage to the cause of end-stage renal failure has, on the contrary, increased. Damage to the renal tubulointerstitium in the elderly, often characterized by long-term asymptomatic conditions, nevertheless can lead to a weakening of renal function due to harmful effects, including. Iatrogenic. The likelihood of irreversible deterioration of renal function increases even more with worsening renal tissue hypoperfusion, for example, with the addition of atherosclerotic stenosis of the renal artery. The clear commonality of risk factors for chronic renal failure and cardiovascular disease, as well as the commonality of the main links in the pathogenesis of kidney damage caused by diseases of the cardiovascular system and metabolic disorders, is noteworthy; This relationship is especially important for the elderly [23].

Hemodynamically significant stenosis of the renal arteries, expressed by the term "ischemic renal disease", is one of the main causes of irreversible deterioration of renal function in the elderly and senile, despite the significant expansion of diagnostic and therapeutic options over the past two decades. , often goes unrecognized until renal failure, which can be accelerated by the use of commonly used antihypertensive drugs and diagnostic interventions (in particular, the use of X-ray contrast agents) in these patients [20].

It is clear that chronic kidney disease is mainly characteristic of patients with widespread atherosclerosis. its complex forms: until atherosclerotic lesions of the renal arteries are detected, patients often suffer from acute myocardial infarction, including recurrent, transient ischemic attacks or cerebral stroke, as well as various angiosurgical

interventions, including. coronary angioplasty. This disease is often detected during angiography, which is associated with a high risk of radiopaque nephropathy [21].

The presence of traditional risk factors - not only arterial hypertension, but also disorders of lipoprotein metabolism, type 2 diabetes, obesity and nicotine addiction, which are often observed in these patients - also determines the high probability of fatal cardiovascular complications in ischemic kidney disease. . It is advisable to promptly eliminate iatrogenic factors that aggravate renal dysfunction in ischemic kidney disease - non-steroidal anti-inflammatory drugs, loop diuretics in large doses that cause relative hypovolemia, but primarily ACE inhibitors and angiotensin II receptor blockers. , which are often prescribed incorrectly in elderly patients with arterial hypertension without proper control [22].

It should be noted that it is not necessary to say that a significant improvement in the long-term prognosis can be achieved with the help of invasive treatment of atherosclerotic stenosis of the renal arteries. angioplasty with stenting, although the results of recent controlled clinical trials, in particular the CORAL study, have shown that with the help of this intervention it is possible to reduce blood pressure and control a number of other parameters that directly or indirectly characterize the prognosis [23, 24].

Of course, the treatment of elderly and senile patients with SBK at all stages is associated with significant difficulties. They are the main group in which polypharmacy should be avoided, and it should always be borne in mind that even the prescription of clinically and pathogenetically justified drugs can lead to the most pronounced manifestations of adverse events. With the development of end-stage renal failure, the decision to initiate and choose the optimal method of renal replacement therapy for this category of patients is often associated with significant difficulties. Not only the severity of CKD and the underlying disease, but also comorbidities - “general” geriatric syndromes (dementia, underweight), as well as a number of social characteristics (difficulties in movement and transportation, decreased critical perception, the need for constant care outside medical institutions) significantly limit the implementation of a hemodialysis program in elderly patients [25].

Several clinical trials, in particular the IDEAL study [26], have shown that early initiation of a hemodialysis program in the presence of residual renal function is not beneficial for elderly patients. If an elderly patient refuses dialysis (such cases are rare in many countries), an interdisciplinary strategy of non-dialysis management (the term “maximum possible conservative management” is used synonymously), which includes the participation of a nephrologist, as well as a nutritionist and a social worker [17]. Special scales are proposed that allow calculating the prognosis to determine the appropriateness of initiating a hemodialysis program in an elderly patient: for example,

the risk increases significantly with significant underweight (body mass index < 18.5 kg / m2), active cancer, chronic heart failure (NYHA functional classes III-IV), diabetes mellitus, cardiac arrhythmias, as well as behavioral disorders and when initiating hemodialysis for urgent indications [18].

The program is combined with hemodialysis, it is collected, including. and according to the results of controlled clinical studies, there is a positive experience with peritoneal dialysis in elderly patients: in particular, this method of renal replacement therapy allows them to avoid at least some of the problems that arise during the formation of blood vessels. maintaining their activity [19]. A special problem of elderly patients remains nutritional disorders, which often occur in this age group and with preserved renal function, but always significantly increase with the development of SBC. The term “protein-energy malnutrition” is also often used to designate the malnutrition syndrome in elderly patients with SBC, the program is aggravated by hemodialysis [20]. The main components of protein-energy malnutrition in an elderly patient undergoing a hemodialysis program include, first of all, an increasing deficit of muscle mass, activation of the acute phase inflammatory response syndrome, increased anemia, impaired phosphorus-calcium metabolism, and weight loss due to cognitive disorders. [11].

Correction of protein-energy malnutrition is also important for elderly patients who, for various reasons, do not start a hemodialysis program. In this regard, the generally accepted recommendation of experts is to control the calorie content of food (30 kcal/kg/day for those over 60 years old) and, if necessary, use energy and micronutrient supplements [21]. Currently, successful experience has been accumulated in the use of drugs of keto-analogs of amino acids for the prevention and correction of protein-energy malnutrition in patients with SBC. At the same time, the use of a complex of keto-analogs of amino acids in combination with a low-protein diet for patients with SBC provides a clinically significant antiproteinuric effect, alleviates the symptoms of chronic renal failure and allows for better control of metabolic processes. disorders and arterial hypertension.

The algorithm for the prevention and correction of protein-energy malnutrition in patients with SBC using keto-analogs of amino acids is presented in the work of Cs. Kovesdi et al. (2013) [17]. The use of anabolic steroids [22], as well as growth hormone to correct protein-energy malnutrition [23], is actively discussed in elderly patients with CKD. For elderly patients, it is important to increase the duration of the predialysis period while preserving residual renal function. In this regard, a low-protein diet provides significant benefits, and evidence in favor of its use continues to accumulate according to the results of randomized controlled clinical trials [24]. G. Brunori et al. (2007) [25] were able to show that the use of keto analogues of essential amino acids

in the non-dialysis treatment of elderly patients with CKD compared with a group on hemodialysis or continuous ambulatory peritoneal dialysis allows to extend the predialysis period by almost 10 months and at the same time achieve the desired result. The 1-year survival rate is almost the same as in the group receiving renal replacement therapy. In addition, patients on a low-protein diet and receiving keto analogues of amino acids had a significant reduction in the frequency and duration of hospitalization, which also indicates an improvement in their quality of life and social adaptation. It is worth noting that the use of a low-protein diet in combination with keto analogues of amino acids did not lead to negative dynamics in indicators characterizing the nutritional status of patients. The absence of a negative effect of a low-protein diet in combination with keto analogues of amino acids in elderly patients was also confirmed in another clinical study [46]. Given that the cost of dialysis therapy accounts for approximately 70% of all costs for the treatment of elderly patients with CKD, prescribing a low-protein diet with keto analogues of amino acids and delaying the start of dialysis to slow the progression of renal failure is of interest from a pharmacoeconomic point of view. An economic analysis of an Italian study (2020) [48] showed that the use of a low-protein diet with keto analogues of amino acids allows for a safe delay of the start of dialysis by an average of 1 year and leads to a saving of approximately 30 thousand euros per person. Elderly patients with CKD for more than 3 years. At the same time, combined therapy with keto analogues of amino acids with a low-protein diet can reduce the cost of treatment for each patient by more than 20 thousand euros during the first year. Overall, optimizing a low-protein diet and developing rational regimens for the use of keto analogues of amino acids can be considered one of the most feasible ways to optimize the treatment of elderly patients with chronic renal failure who, for various reasons, have not started renal replacement therapy.

Of course, elderly people with SCD remain one of the most difficult patient groups to manage. Nevertheless, a careful correction of existing risk factors, an interdisciplinary approach to determining treatment and rehabilitation tactics, and the most effective use of therapeutic strategies, the effectiveness of which can be discussed by referring to the experience of controlled clinical trials, allow us today to believe in a significant improvement in the prognosis for these patients.

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