Features Of The Clinical Course, Diagnosis, Therapy And Assessment Of The Quality Of Life Of Patients With Chronic Kidney Disease

Botir T. Daminov[1], Narina R. Raimkulova[2], Zulfia T. Sabirjanovna[3], Aziz K. Tursunbaev[4]

[1]MD, Rector of the Tashkent Pediatric Medical Institute, Tashkent, Uzbekistan.
[2]MD, Phd, Tashkent Pediatric Medical Institute, Tashkent, Uzbekistan.
[3]MD, PhD, Tashkent Pediatric Medical Institute, Tashkent, Uzbekistan.
[4]MD, PhD, Tashkent Pediatric Medical Institute, Tashkent, Uzbekistan.
E-mail: [1]mail@tashpmi.uz, [2]robertovnanarina@gmail.com, [3]mail@tashpmi.uz
[4]mail@tashpmi.uz

ABSTRACT
This article describes the features of the clinical course of the disease, assesses the quality of life, diagnostic criteria for the disease, modern classification and tactics of hypotensive therapy in patients with chronic kidney disease, Pathogenetic mechanisms of chronic kidney disease, Correspondence of the stages of chronic kidney disease to the ICD-10 coding.
Various modern studies are described to assess the quality of life of patients using the SF-36 questionnaire, which includes 8 scales: physical functioning, role functioning due to physical state, pain intensity, general health, vital activity, social functioning, role functioning due to emotional state and mental health.

KEY WORDS: chronic kidney disease, quality of life assessment, arterial hypertension, hemodialysis, predialysis period.

1. INTRODUCTION

Chronic kidney disease is a supra-nosological concept that unites all patients with signs of kidney damage and / or decreased function that persists for 3 months or more [1]. This general mechanism of renal tissue damage is becoming universal and little dependent on the underlying kidney disease. That is why in recent years the nephrological world has adopted a new concept - the diagnosis of chronic kidney disease (CKD). The general mechanism of disease progression also opens up general opportunities for attempts * to slow down this mechanism and delay the need for renal replacement therapy [2.22]. If the glomerular filtration rate (GFR) is increased or maintained, as well as in patients with an initial decrease (60≤ GFR <90 ml / min 1.73 m2), for the diagnosis of CKD, signs of kidney damage (albuminuria ≥ 30 mg / day or urine Al / Cr ratio ≥30 mg / g (≥3 mg / mol), changes in urine flow, electrolyte disturbances, structural and morphological changes, renal history, transplantation) If GFR <60 ml / min, 1 , 73 m2 CKD even in the absence of markers of kidney damage (Table 1) [1,2].

Table 1. Diagnostic criteria for CKD *

Markers of Renal Damage (one or more)	Albuminuria

	Change in urinary sediment
	Tubular dysfunction
	Histological changes
	Structural changes in imaging research methods
	Kidney transplantation in anamnesis
GFR reduction	GFR <60 ml / min 1.73 m2 (category of GFR 3a-5)

 *Note: * -* when stored for more than 3 months

Abbreviations: GFR - glomerular filtration rate, Al / Cr - albumin / creatinine ratio.

It is known that current international recommendations suggest classifying CKD in terms of GFR (Table 2) and the level of albuminuria (Table 3), since GFR and urinary albumin excretion are independent diagnostic and prognostic values [1, 2,15,17,18].

Table 2. Classification of CKD by GFR level

Stage	GFR level (ml / min 1.73 m2)	Description
C1	>90	High or optimal *
C2	60-89	Slightly reduced *
C3a	45-59	Moderately reduced
C3б	30-44	Significantly reduced
C4	15-29	Sharply reduced
C5	<15	End-stage renal failure (D / T) **

Note: * - in the absence of signs of kidney damage, categories C1 and C2, GFR does not meet the criteria for CKD; ** - if the patient is prescribed renal replacement therapy, its type should be indicated - dialysis (D) and transplantation (T).

Table 3. Indexing of CKD in albuminuria

Grade Indexing Indicator, assessment method	Optimal or slightly increased (A1)	High (A2)	Very high (A3)
Albumin in the urine			
DAE (mg / day)	<30	30-300	>300
Al / Cr urine (mg / g)	<30	30-300	>300
Al / Cr urine (mg / mmol)	<3	3-30	>30
Total protein in urine			
DPE (мг/сут)	<150	150-500	>500
Al / Cr urine (mg / g)	<150	150-500	>500
Al / Cr urine (mg / mmol)	<15	15-50	>50

Abbreviations: DAE, daily albumin excretion; Al / Cr ratio, albumin / creatinine; DPE - daily protein extraction; Al / Kr is the total protein / creatinine ratio. [1].

Current international guidelines also suggest a division into 3 stages of CKD according to GFR.

Level at stages 3a and 3b. Due to the fact that renal cardiovascular prognosis is not the same in groups of people with stage 3 CKD with GFR from 59 to 45 ml / min 1.73 m2 and from 44 to 30 ml / min 1.73 m2. [1]

While in the subgroup of individuals with a GFR of 59 to 45 ml / min 1.73 m2 cardiovascular risks are very high with moderate progression of CKD, patients with a GFR of 44 to 30 ml / min 1.73 m2 are at risk of the development of end-stage renal failure (ESRD) is higher than the risk of death. cardiovascular complications [1.18].

As you know, the revision of the International Classification of Diseases 10th revision uses the code N18 (which was previously used to denote chronic renal failure) for CKD.

N18.1-N18.5 were designated for stages 1-5 of CKD (Table 4), code N18.9 was used to designate CKD with unspecified stage [5].

Table 4. International Classification of Diseases (ICD) -10 according to the stages of chronic kidney disease

CKD stages	ICD-10 code
C1	N 18.1
C2	N 18.2
C3a	N 18.3
C3б	N 18.3
C4	N 18.4
C5	N 18.5
Stage not specified	N 18.9

It should be noted that the allocation of different categories of GFR and albuminuria allows to classify patients with CKD according to the risk of renal outcomes (decreased GFR, progression albuminuria, acute renal failure, end-stage renal failure) and various other complications such as cardiovascular morbidity and mortality, metabolic, lipid, hemodynamic disorders and drug toxicity [1.3, 4,5,6,7,8,9,19,20,21,24,25,27]. Relationship between systemic arterial hypertension and progressive decline in renal function at present it is considered long ago proven [11,19].

According to the large prospective MRFIT study (16 years of follow-up), which included 332544 patients with arterial hypertension (AH), the risk of developing end-stage renal failure was 22 several times higher in people with systolic blood pressure (BP) 210 mm Hg. Art. and more compared to those for whom it did not exceed 120 mm Hg. Art. Individuals with milder hypertension were also characterized by increased risk of developing CKD [6,8,11,19].

All classes of CKD can be used for antihypertensive therapy in patients with CKD antihypertensive drugs, taking into account the indications and contraindications for their use, however, angiotensin-converting enzyme inhibitors (ACE inhibitors) or angiotensin II receptor blockers (ARB) are the vehicle of choice [11]. The first step to lowering blood pressure in patients with CKD salt intake should be limited [24,25].

Currently, the effect of the main factors in the progression of CKD, to which most authors belong a sign of hypertension and albuminuria, is directly related to an increase in the activity of systemic and local (renal) renin-angiotensin-aldosterone systems (RAAS) [8,17,18,19,27].

The pathophysiological prerequisites for the negative effect of angiotensin II are: development of systemic and intracranial hypertension, hyperfiltration, tubulointerstitial fibrosis [15,17].

As everyone knows, the fact that intraglomerular hypertension helps reduce negative charge the basement membrane of the renal glomeruli, and also increase the size of its pores, thereby increased passage of plasma proteins into the renal tubules. As a result, albuminuria appears or disappears escalated. [9,10,27]. These processes are accompanied by an increase in the production of cytokines and growth factors (platelet growth factor, a transforming growth factor that causes an increase formation of mesangial matrix and collagen. The result of such changes is the development secondary focal segmental glomerulosclerosis and renal dysfunction [9, 10, 20].

Albuminuria, like arterial hypertension, is the most significant factor in the progression of renal failure pathology. The influence of angiotensin II on its development has now been proven and can be direct (through the platelet activating factor, the action of which is determined by the activity of the intrarenal AN) and indirect (through the mechanisms described above for the violation of intra-renal hemodynamics). [6,8,11].

The rate of progression of renal dysfunction, according to modern concepts, directly depends on the severity of albuminuria. Thus, the pharmacological inhibition of RAAS by ACE inhibitors and ARBs is a serious problem pathogenetically determined mechanism of nephroprotection [16].

The blockade of the action of angiotensin II leads to a decrease in systemic and intraglomerular arterial pressure, decreases hyperfiltration, decreases albuminuria and the intensity of proliferative processes in the kidneys, preventing the development of nephrosclerosis [16].

In large multicenter trials in patients with CKD, microalbuminuria, and diabetes nephropathy, it was possible to prove that long-term use of i-ACE inhibits the progression of renal failure [3,4,5,6,8]. At the same time, there are concerns about the possible deterioration of renal function due to the appointment of angiotensin-converting enzyme inhibitors, especially in the presence of initial renal failure [25].

As mentioned earlier, the use of ACE inhibitors leads to a decrease in intracranial pressure - due to the expansion of the deflecting arteriole. An excessive decrease in it can lead to an increase in creatinine levels [16,25]. An important role in the reduction of glomerular filtration when prescribing these drugs is attributed to the drop in mean arterial pressure in the aorta to a level that cannot adequately maintain renal perfusion (55 mm Hg) [16].

The factors provoking an increase in azotemia when using i-ACE may be a decrease in the volume of circulating fluid due to diuretic use, bilateral renal artery stenosis and stenosis of a single renal artery [16]. In addition, the decrease in ACE clearance in CKD should be considered. As a result, treatment with ACE inhibitors is recommended, starting with small doses, under strict control of blood pressure, serum creatinine and potassium [15,16,17,18,19]. A prerequisite for adequate nephroprotection in patients with high blood pressure is achievement of certain target values of blood pressure [11].

According to the recommendations of the All-Russian Scientific Society of Cardiology in patients with chronic kidney disease, these values are below 130/80 mm Hg. Art. [1]. For proteinuria above 1 g / L, blood pressure targets should be below 125/75 mm Hg. Art. Most often, to achieve the desired result, combined antihypertensive therapy is required [6,11]. Thus, according to the results of our research, the high efficiency of ACE inhibitors in slowing down the rate of progression of CKD is undeniable.

However, there is no consensus on the issue of how effective, and most importantly there is no safety factor for this pharmacological class in patients with CKD. Improvements in renal replacement therapy have led to a significant reduction in mortality in patients with CKD.

At the same time, it highlighted the problem of the quality of life of this group of patients. [12,13]. Quality of life is an essential characteristic of physical, mental, emotional and social human functioning based on his subjective perception [12,13,14,23].

Currently available evidence suggests that regular quality of life surveys in the context of therapy can help to timely carry out adequate treatment correction [1,14]. Most often, to assess the quality of life in modern studies, the SF-36 questionnaire (Short questionnaire of 36 items) is used.

The SF-36 includes 8 scales: physical functioning, role functioning according to physical condition, pain intensity, general health, vitality, social functioning, role functioning due to emotional state and mental health.

The scale "physical functioning" characterizes the range of possible physical activity, "role" functioning due to physical condition "- the influence of physical condition on the assessment of the role in life, the scale" pain intensity "reflects the severity of the pain syndrome and its effect on the patient's condition.

During normal activity, the scale "general health" allows you to judge the general condition of the patient. The latter characterizes "vital activity" in contrast to fatigue.

The scale of "social functioning" reflects the degree of limitation of social life. Emotional Role-Based Functioning allows us to judge the effect of emotional status on the patient's role in life.

The Mental Health Scale measures anxiety, depression, and decreased emotional and behavioral control.

Five scales (physical functioning, role functioning due to physical condition, pain intensity, social functioning, role functioning due to emotional state) reveal "limitations". They ask respondents to rate their condition in points (from 1 to 100). Accordingly, the fewer restrictions apply to each of these scales, the higher the indicator evaluating one side or another of the patient's life.

Three scales (general health, vitality, mental health) reflect "well-being" with a wider range of negative and positive states. The absence of restrictions corresponds to 50% of the results on these scales, and the maximum values (up to 100 points) indicate the predominance of positive statements and a positive assessment of one's health.

Based on the results listed above, general parameters are calculated - the physical component of health (PCH) and the mental component of health [12,13,14].

In nephrology, most works devoted to the study of the quality of life of patients concern patients on dialysis [12,13,14]. In the predialysis population, there is much less work on assessing the quality of life of patients, and their results are very contradictory.

So, for example, Yu.L. Chesnokova et al. A comparative study of the quality of life of patients with predialysis CKD (42 people, mean age 40 + 8.9 years, GFR 11.5 + 7.5 ml / min) and those receiving programmed hemodialysis treatment (57 people, mean age 41.8 + 9 , 9 years old). using the SF-36 questionnaire.

It turned out that in the group of patients who did not require renal replacement therapy, indicators of quality of life were better than in the dialysis group.

An important result of the work was the discovery in the first group of a statistically significant direct correlation between the glomerular filtration rate and such questionnaire scales as physical functioning and role functioning depending on physical and emotional state. At the same time, the duration of CKD did not correlate with any of the quality of life indicators.

Perlman R.L. et al., Unlike previous authors, did not reveal in their work (634 patients with predialysis CKD, mean GFR 23.6 + 9.6 ml / min / 1.73 m2) a significant relationship between glomerular filtration rate and quality of life indicators.

However, this study also managed to demonstrate higher values of all scales of the SF-36 questionnaire in patients with predialysis CKD compared with patients with programmed hemodialysis (PGD), and in this case, the differences between the groups turned out to be statistically significant.

According to Kalender V. et al., The quality of life in patients with predialysis CKD was lower than in patients treated with peritoneal dialysis.

A study by Lopez Revuelta K. et al. Among 318 CKD patients showed that low values of the mental health component at initiation of dialysis therapy are a significant predictor of subsequent all-cause mortality during renal replacement therapy, especially in patients with diabetes mellitus. ... Thus, the group of patients with CKD is an ever-growing population that requires close attention not only to nephrologists and dialysis specialists, but also to general practitioners.

The leading role of cardiovascular pathology in the structure of mortality in patients receiving renal replacement therapy dictates the need to improve the algorithms for examination and treatment of these patients at the predialysis stage of the disease [12,13,14].

Changes in the cardiovascular system in CKD are caused by many factors, both traditional (age, gender, etc.) and actual renal failure. The results of studies devoted to the study of the pathogenetic role of each of these factors are contradictory and require clarification.

The possibility of regression of pathological changes in the cardiovascular system under the influence of a certain drug intervention (for example, LV myocardial hypertrophy during therapy with ACE inhibitors) in patients with arterial hypertension has been shown. It seems promising to conduct such studies among patients with CKD [3,4,5,6,].

Identifying the factors that determine the rate of progression of CKD is extremely important currently [18]. Early detection and targeted action against potentially remedies can significantly improve patient prognosis [18].

And in conclusion, we can conclude that the problem of the quality of life of patients with chronic kidney disease has not been sufficiently studied.

In particular, in patients with predialysis CKD, it remains unclear which manifestations of the disease primarily contribute to a decrease in the quality of life.

In addition, to date, the specific possibilities of various therapeutic measures in terms of quality of life indicators in this cohort of patients have not been determined.

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