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# Chronic Kidney Disease

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**Abstract:** Chronic renal failure is a non-specific syndrome that develops in hereditary, congenital and acquired kidney diseases due to the progressive death of nephrons and stroma with a steady decrease in the ability of the kidneys to perform homeostatic functions.

Chronic kidney disease (CKD) is the presence of kidney damage or decreased kidney function for three months or more, regardless of the diagnosis. The SCF value is used to differentiate between the stages of CKD. The authors identified a connection abetween renal pathology and cardiovascular diseases, which allowed them to talk about a cardiorenal continuum.

**Keywords:** chronic kidney disease, risk factors, cardiorenal continuum The concept of chronic kidney disease (CKD).

**Annatation** was developed by the National Kidney Foundation (NKF). CKD is “the presence of kidney damage or decreased kidney function for three months or more, regardless of diagnosis”

Congenital and genetic factors

- Congenital decrease in the number of nephrons
- Polymorphism of genes controlling the expression of nephrotropic biologically active substances

There were several reasons for introducing the concept of CKD. One of the main ones was that in recent years the unity of key links in the pathogenesis of various kidney diseases has been revealed . Risk factors for the development and progression of chronic kidney diseases

Obviously, the factors risk have certain similarities with those in cardiovascular diseases.

**The purpose of the study** How should we treat the concept of CKD? Certainly,

it is not a nosological unit. The diagnosis of the underlying disease should be in each specific case.

**Materials and method**

The term CKD has been adopted in the USA and many other countries. In Russia, the VI Congress of the Scientific Society of Nephrologists, which took place on November 14-17, 2005 in Moscow, unequivocally supported the need for widespread implementation of the CKD concept in the practice of domestic healthcare. The authors [1] believe that the adoption of the term CKD should limit the use of the term "chronic renal failure (CRF)". In the NKF classification (table 3), CKD remained only as a synonym for stage V CKD in the form of renal failure (RF).

**Results**

Diagnostics

The fifth stage of CKD corresponds to the term "terminal renal failure" or "end stage

renal disease" of English-speaking authors and requires the start of renal replacement therapy (RRT). Earlier stages of CKD, i.e. I-IV, involve the use of a set of measures that allow either to slow down the deterioration of kidney function or to best prepare the patient for RRT. Despite the caution of Russian nephrologists, the concept of CKD is gaining more and more supporters, since its advantages are becoming more and more obvious.

CKD is not a mechanical combination of chronic kidney damage of various origins.

This concept is based on the unity of the leading pathogenetic mechanisms of progression of the pathological process in renal tissue, the commonality of many risk factors for the development and progression of kidney diseases and the resulting similarity of methods of therapy, primary and secondary prevention [2]. Perhaps, in practical activity, CKD will take the same place as ischemic heart disease or COPD. The authors [1], along with the concept of CKD, consider it necessary to preserve in Russia the concept of "terminal renal failure (TRF)." The state of TRF should include patients receiving RRT and individuals with stage V CKD, for whom replacement therapy has not yet been started or for whom it is not carried out due to organizational problems. Examples of diagnosis formulation:

**Discussion**

1. Stage III hypertension, third-degree arterial hypertension, very high risk of cardiovascular complications. Hypertensive nephrosclerosis. Chronic kidney disease stage III.
2. IgA nephropathy. Isolated urinary syndrome. Chronic kidney disease stage I or stage III.
3. Type 2 diabetes mellitus. Diabetic nephropathy. Chronic kidney disease stage II or stage III.

The introduction of the CKD principle required the use of a simple criterion, reliable and inexpensive for clinical practice. The developers of the US National Kidney Foundation have convincingly proven that such a criterion is the glomerular filtration rate (GFR): the degree of reduction in GFR is closely associated with other clinical, metabolic changes that occur as chronic nephropathy progresses.

Of the many proposed methods for determining GFR, the "calculated" ones have received the greatest recognition.

In "adult" nephrology, the Cockroft-Gault and MDRD formulas are used [2].

The most acceptable formula is one that requires only the serum creatinine concentration level (MDRD) from the biochemical indicators.

- not less than 10%, and in some individuals (the elderly, patients with type 2 diabetes, African Americans) – up to 20%. A link was found between renal pathology and cardiovascular diseases, which allowed us to talk about a cardiorenal continuum. It was noted [6] that in individuals aged 65 years and older, a moderate decrease in renal function was accompanied by an increase in the prevalence of hypertension (from 36 to 55%), coronary heart disease (from 13 to 26%), and CHF (from 3 to 8%). In patients aged 50-75 years, the risk of cardiovascular le-increased by 26% for every 5 ml/min decrease in SCF. One of the key pathogenetic links of the cardiorenal continuum is arterial hypertension (AH). It has now been proven that AH of any degree (and not just severe, uncontrolled, as was previously thought) is the leading risk factor for the development of terminal renal failure.

Hypertensive nephropathy begins to develop already with stage I AH. Increased systolic blood pressure, which is considered an independent risk factor for CKD, predisposes to the greatest extent to hypertensive kidney damage [4]. Hypertensive kidney disease is characterized by increasing global nephrosclerosis involving glomerular structures, tubulointerstitium, and maladaptive restructuring of the vascular bed. Hypertensive kidney disease develops in parallel with that of other target organs. In the diagnosis of hypertensive nephropathy, the detection of microalbuminuria (MAU) plays a special role. Table 5 shows the criteria for assessing MAU. Urine is collected either over a certain period of time (preferably over a day) or in a single urination (in the latter case, creatinine concentration is additionally determined in the urine sample and the albumin/creatinine ratio is calculated)

MAU reflects the presence of generalized endothelial dysfunction in the body. In large studies (PREVEND, LIFE), MAU was detected in 20-30% of individuals with hypertension. The presence of MAU is a formidable sign and requires the initiation of reno- and cardioprotective measures. Among the risk factors for CKD, the following common ones should be mentioned: obesity, carbohydrate

metabolism disorders, lipoprotein metabolism, hyperuricemia, smoking, use of non-narcotic analgesics and non-steroidal anti-inflammatory drugs, HIV, HBS and HCV infection. Old age is one of the leading risk factors for CKD. In addition to age-related involutional changes in renal tissue, old people have late stages of chronic nephropathy (diabetic, urate), chronic glomerulonephritis; cardiovascular diseases (atherosclerosis, heart failure, hypertension) are common. In the early stages of CKD, when there is a normal SCF, the diagnosis of the syndrome should be based primarily on urine test data (proteinuria, hematuria). A decrease in the relative density of urine (Zimnitsky test), indicating the loss of the concentration function of the kidneys (mainly tubular disorders) often outpaces the decrease in SCF. In patients with risk factors for CKD, MAU is determined. To clarify the nosological form underlying CKD, instrumental methods are used, primarily ultrasound, in some cases - computed tomography. If CKD is suspected, repeated blood pressure measurements are mandatory. The rate of progression of CKD is variable. It largely depends on the nosological form. But CKD itself worsens the patient's prognosis, and not only due to the formation of terminal PN. The leading factors of unfavorable prognosis for patients with CKD are cardiovascular complications: stroke, myocardial infarction, chronic heart failure. Considering that AG is a significant risk factor for CKD, regular examination of SCF, MAU, general urine analysis, determination of creatininemia, and renal ultrasound are necessary during monitoring of patients with hypertension.

**Summary** Timely detection, prevention, and treatment of CKD are important areas in increasing the active life expectancy of the population.

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