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Changes in the Structural and Functional State of Myocardium in Patients with Chronic Kidney Disease at Different Stages of Development

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Abstract: The aim of the study was to evaluate clinical and laboratory parameters and the state of structural and functional changes of cardiovascular system in patients with CKD at different stages of development in Samarkand region. Early diagnosis of cardiovascular complications in CKD is the basis of complex therapy of patients. Combined work of nephrologist and cardiologist, with high probability, leads to good results of treatment and timely management of possible complications.

Keywords: central haemodynamics, chronic kidney disease, echocardiography

Abstract: Chronic kidney disease (CKD) is a pathological condition of the kidneys due to morphological changes and/or a decrease in their functional activity over a certain period of time (three months or more), and the diagnosis can vary widely. This process proceeds in a post-acute fashion based on a reduction in renal function [1]. In terms of prevalence, CKD belongs to the group of diseases that have a great impact on society (hypertension (HD), DM, obesity, metabolic syndrome (MS), etc.), with 12 to 18% of the world's people suffering from it. Signs of structural changes and reduced kidney function are detected in about 10% of people worldwide. Similar data were obtained in all countries, regardless of their level of economic and social development. CKD is more prevalent in the older age group. Thus, in people aged over 60 years, the incidence of the disease reaches 39.4%, while in people aged 40 to 59 years, CKD is detected three times less often (12.6%), and among younger people (20-39 years) only in 8.5% of cases. The prevalence of CKD is higher in people with diabetes than without diabetes (40.2% vs. 15.4%) and with CVD than without (28.2% vs. 15.4%), and it is twice as common in patients with AH than in those without (24.6% vs. 12.5%) [2]. Decreased functional activity of the kidney is a consequence of pathological changes in haemodynamics and metabolism of nephrons, leading to a decrease in the glomerular filtration rate (GFR) - one of the most accurate indicators of the functional state of the kidneys. The above changes lead to depletion of compensatory capabilities of the organism, which, in turn, forms the basis for the development of cardiovascular complications of renal genesis. These complications are satellites of CKD at any stage. It is established that the predictor of high risk of cardiovascular disorders and unfavourable prognosis is not only an increase in the left ventricular myocardial mass (LVM), but also a change in the geometric model of the heart as a whole. In this connection, it is of practical interest to evaluate clinical and laboratory parameters and the state of cardiac muscle and heart sections in patients with CHF. Proceeding from the above mentioned, the purpose of our study was to evaluate clinical and laboratory parameters and the state of structural and functional changes of cardio-vascular system in patients with CHBP vascular system in patients with CKD at different stages of development in Samarkand region.

Materials and methods: We examined 70 patients with chronic kidney disease: 20 (31,22,%) of them had glomerulonephritis, 28 (43,8%) had pyelonephritis, 12 (18,72%) had diabetic nephropathy, 10 (15,62%) had polycystic kidney disease with central haemodynamic disorders. The age of the examined patients ranged from 22 to 65 years (mean age was 38.93±9.1 years), the main part of patients was represented by men - 46 (67%), and women were 24 (33%). Assessment of organs and

systems was carried out by objective, subjective and laboratory-instrumental methods of investigation, as well as Doppler-echoCG. Echocardiographic study was performed in 3 modes (Doppler, M- and B-). In accordance with the standards given in the protocol of the American Echocardiographic Society, measurements in our study were performed when observing two-dimensional images of the left ventricular (LV) cross-sectional area at the level of papillary muscle structures of the heart in M-mode [11]. The following data (indices) were used for further analyses: left ventricular end-systolic diameter (LVSD, mm), left atrial end-systolic diameter (LA, mm), left ventricular end-diastolic diameter (LVED, mm), left ventricular end-diastolic volume (LVED, ml), left ventricular end-systolic volume (LV end-systolic volume, ml), right ventricular diastolic dimension (RV, mm), interventricular septum thickness (IVS, mm), left ventricular posterior wall thickness (LVP, mm). STATISTICA 5.0 programme was used for statistical processing of the study results. Quantitative parameters are represented by medians and intelligent intervals. Multiple intergroup comparisons were performed by Mann-Whitney test ($p<0.05$).

Results and discussion: The analysis of laboratory results of the study showed that leukocytosis, shift of leukocytic formula, acceleration of COE were detected in blood, proteinuria, leukocyturia, bacteriuria, haematuria were detected in urine. In chronic kidney disease stage I, changes in the general blood analysis were absent in 39.1% of patients, isolated acceleration of COE was detected in 4.7%, increase of all three parameters: leukocytosis, leukocytic formula shift to the left, COE acceleration - in 3.13%. At stage 2: no changes in the general blood analysis were observed in 7.81% of patients, isolated acceleration of COE - in 9.34%, increase of all three parameters - in 3.12%. At stage 3: increase of all three parameters (6,25%), isolated acceleration of COE (9,38%) leukocytosis and COE acceleration (7,84%), increase of all three parameters (4,68%). In stage C5: isolated acceleration of SLE (10,93%), leucocytosis and acceleration of SLE (7,81%), increase of all three parameters (14,1%). In the general urine analysis at C1 stage of chronic kidney disease patients most often had leukocyturia (9,38%), leukocyturia and haematuria (7,81%), leukocyturia and bacteriuria (3,12%), leukocyturia, bacteriuria and haematuria (1,56%). In C2 stage:leukocyturia (6.25%), leukocyturia and haematuria (4.68%), leukocyturia and bacteriuria (3.12%). At C3 stage:leucocyturia (9.38%), leucocyturia and haematuria (7.81%), leucocyturia and bacteriuria and haematuria (4.68%). At C4, leucocyturia and haematuria (10.93%), leucocyturia (9.38%), leucocyturia and bacteriuria (4.68%). At C5 stage: leukocyturia and haematuria (12.5%), leukocyturia (10.93%), leukocyturia, bacteriuria and haematuria (28.1%). In the studied patients, a decrease in SCF was noted in patients with glomerulonephritis- 81 ml/min, pyelonephritis-95 ml/min, diabetic nephropathy-69 ml/min, polycystic kidney disease-89 ml/min. Analysis of laboratory results showed that the blood showed a decrease in haemoglobin and haematocrit.

In group I with CKD stage 1-2 anaemic changes were observed in 2 (3.77%) patients, and in CKD 3A-3B 9 patients it was 11.25%. In CBP 4-5 st anaemic syndrome was noted in 11 (20.75%,) patients. Among group II patients anaemia was detected more frequently in stage 4-5 CKD 20 (74%) patients and much less frequently in stage 1-2 CKD patients 5 (18,5%) . Anaemia was noted in moderately severe CKD stage 3A-3B in 12 (44%) patients. At examination of patients on EchoCG there was a change in the following indications of LV remodelling: LV TMJ by 7,8% ($p=0,03$), LV MM by 9,1% ($p=0,04$) and LV IMM by 6,9% ($p=0,03$) more, in comparison with patients with CBP stage 1. In the presence of 5-stage CHD, LV TZS, LV IMM, and LV BMD were significantly greater than in 2-4-stage CHD by 6.8%, 8.1%, and 4.6%, respectively($p<0.05$). Comparison of LV structural changes and renal functional state showed that regardless of renal nitrogen excretion function, the predominant variant of LV remodelling in all groups of patients was eGFR, which was diagnosed in 21 patients with CHF of 1 stage, 19 patients with CHF of 2-4 stages, and 4 patients with CHF of 5 stages. Concentric remodelling (CRM), characterized by increase of relative LV wall thickness at normal myocardial mass was observed in 12 patients. At the same time CGRM was registered in 3 patients with CHF stage 1, 6 patients with CHF stages 2-4, and 2 patients with CHF stage 5. Normal LV geometry was observed in 10 patients with CPB 1 stage and in 8 patients with CPB 2-4 stages. In all groups of patients different types of LV AF abnormalities were recorded. However, deterioration of renal nitrogen excretion

function was accompanied by an increase in the frequency of unfavourable LVEF variants. Normal parameters of LV AF were observed in 9 patients with CHF 1st, in 6 patients with CHF 2-4st. The frequency of occurrence of CAGL in the group was 24 %. A certain role in the development of asymmetric hypertrophy (AHF) is attributed to the stereometric features of LV, which cause relatively greater stretching of LVD compared to other walls and its more eccentric location. Thus, 9 cases of AGLJ were registered in the observation, which is a consequence of adaptation arising from volume overload; eccentric hypertrophy (EHHL) was diagnosed in 9 cases. The mixed variant of the geometrical model of LVH (Mixed variant of the geometrical model of HLH), characterised by a significant thickening of LV walls in combination with an increase in its cavity, is associated with a combined effect on the myocardium of such hemodynamic factors as pressure overload and volume overload. This variant of the geometrical model was revealed at the initial stage in 10.

Conclusions: A persistent regularity between the frequency, character, severity of LV remodelling and decrease in the index of glomerular filtration was revealed. Eccentric variation of cardiac hypertrophy is directly proportional to the time of onset of CPN and the degree of its progression. HLH has a concentric character and a tendency to appear at early stages of CKD, and also correlates with the duration of the course of AH. The necessity of dynamic use of echoCG in diagnostics and monitoring of patients at different stages of CKD was noted. This measure contributes to the timely detection of changes characteristic of cardiac remodelling, lesions of the valve apparatus, inflammatory process in the pericardium and systolic dysfunction. Early diagnosis of cardiovascular complications in CKD is the basis of complex therapy of patients. Combined work of nephrologist and cardiologist, with high probability, leads to good treatment results and timely treatment of the above complications.

Literature.

1. Шодикулова Г. З., Мухитдинова Г. З., Атоев Т. Т. ОЦЕНКА СОСТОЯНИЯ ЦЕНТРАЛЬНОЙ ГЕМОДИНАМИКИ У БОЛЬНЫХ С ХРОНИЧЕСКИМИ БОЛЕЗНЯМИ ПОЧЕК В САМАРКАНДСКОМ РЕГИОНЕ //Достижения науки и образования. – 2021. – №. 8 (80). – С. 59-63.
2. Бабамурадова З., Насирова А., Искандарова Ф. ЭНДОТЕЛИАЛЬНАЯ ДИСФУНКЦИЯ ПРИ ХРОНИЧЕСКОЙ СЕРДЕЧНОЙ НЕДОСТАТОЧНОСТИ В СОЧЕТАНИИ С САХАРНЫМ ДИАБЕТОМ //Журнал кардиореспираторных исследований. – 2021. – Т. 2. – №. 3. – С. 49-52.
3. Najmiddinov A., Ibragimova N., Muxitdinova G. SILIKOZ PATOGENEZIDA KREMNIY DIOKSIDI VA YALLIG‘LANISH MEDIATORLARINING O‘RNI //Евразийский журнал медицинских и естественных наук. – 2023. – Т. 3. – №. 12. – С. 63-77.
4. Zikriyayevna S. G., Zoxirovna M. G., To’raqulovna Q. S. PREVENTION OF CHRONIC KIDNEY DISEASE AND CHRONIC HEART FAILURE //Spectrum Journal of Innovation, Reforms and Development. – 2022. – Т. 4. – С. 408-414.
5. Zikiryayevna S. G. et al. Kidney Damage in Patients with Chronic Cardiac Insufficiency and Obesity //Texas Journal of Medical Science. – 2022. – Т. 13. – С. 72-78.
6. Bozorova Chekhroza Sodik kizi , M. G. Z. . , K. T. A. U. . ,. (2024). Clinical and Immunological Features of the Diffuse Form of Systemic Scleroderma. *American Journal of Pediatric Medicine and Health Sciences (2993-2149), 2*(3), 433–436.
7. Насирова А. А., Бабамурадова З. Б., Базарова С. А. Особенности иммунологических показателей у больных хронической обструктивной болезнью легких и бронхиальной астмой //Журнал кардиореспираторных исследований. – 2020. – Т. 1. – №. 3.
8. Насирова А. А. ХАРАКТЕРИСТИКИ КАЧЕСТВА ЖИЗНИ БОЛЬНЫХ БРОНХИАЛЬНОЙ АСТМОЙ, ХРОНИЧЕСКОЙ ОБСТРУКТИВНОЙ БОЛЕЗНЬЮ ЛЕГКИХ И ИХ СОЧЕТАНИЕМ //Журнал кардиореспираторных исследований. – 2022. – Т. 3. – №. 3.

9. Шодикулова Г. З., Элламонов С. Н., Насирова А. А. Частота встречаемости дилатационной кардиомиопатии в узбекской популяции //Вестник науки и образования. – 2020. – №. 13-2 (91). – С. 44-48.
10. Насирова А. А., Садикова Ш. Н., Курбанова З. П. Современные представления о роли поверхностного фенотипа лимфоцитов при хронической обструктивной болезни легких и бронхиальной астме и их лечение //Вестник науки и образования. – 2020. – №. 13-2 (91). – С. 49-53.