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Evaluation of Renal Dysfunction in Chronic Heart Failure Caused by Rheumatic Heart Disease

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ABSTRACT

Chronic heart failure (CHF) is the most common clinical syndrome in the world and, being the final stage of a number of cardiovascular and other organ diseases, one of the main causes of death and disability. Despite the widespread use of proven drugs for treatment, mortality among patients within 5 years after diagnosis is 60% in men and 45% in women. Mortality in patients with chronic heart failure is 4.0–10.3 times higher than in the general population of the same age.

KEYWORDS: Chronic heart failure (CHF), HF, coronary heart disease (CHD), arterial hypertension (AH), KIM-1.

Materials and methods. This study was conducted in 2022 and 2023 in patients with chronic heart failure due to rheumatic heart disease, who were treated at the clinic of the Bukhara State Medical Institute and the regional multidisciplinary medical center. Of these, patients whose serum creatinine level exceeded the norm over the past 3 months and whose true glomerular filtration rate, calculated using this method, ranged from 60 to 90 per minute per 1.73 m² of body surface area were included in the observation. To implement the solution of the research objectives, the following was carried out. The study involved 100 patients with chronic heart failure who were treated in a hospital setting and then were under observation. The first group consisted of 60 patients with rheumatic heart disease, the second group - 40 patients with chronic heart failure due to ischemic heart disease and arterial hypertension. The control group included 20 healthy individuals. The average age of the first group was 46.1 ± 1.3 years, among them there were 22 men (36.6%) and 38 women (63.4%). The average age of the second group was 56.1 ± 1.5 years, it included 25 (62.5%) men and 15 (37.5%) women. The average age of the control group was 41.4 ± 1.2 years, 10 (50%) men and 10 (50%) women.

Results and discussion. The patients included in the study were compared with the intrarenal hemodynamic parameters obtained before and after treatment. In addition, a number of other factors affecting intrarenal hemodynamics were studied. In the control group, i.e. in healthy individuals, the average systolic blood flow velocity (SBFV) was 97.8±5.7 cm/s in the main renal artery, 84.4±4.3 and 64.3±4.6 cm/s in the segmental and intersegmental arteries, respectively. . .

In patients with chronic heart failure due to rheumatic defects, the systolic blood flow velocity was 68.4 ± 3.4 cm/s, 57.6 ± 2.2 cm/s and 49.5 ± 1.1 cm/s, respectively. When comparing the parameters of the first group with the control group, a highly reliable difference was noted ($p < 0.001$). Secondly, in patients with chronic heart failure due to ischemic heart disease and hypertension, the values of PSV were 75.6 ± 4.2 cm/s ($p < 0.01$), 64.2 ± 3.8 cm/s ($p < 0.001$) and 54.2 ± 0.8 cm/s ($p < 0.001$). In all renal arteries in the first and second groups, a significant decrease in systolic blood flow velocity was observed.

Conclusion. A highly reliable decrease in KIM-1 levels in chronic heart failure of rheumatic origin after standard treatment with empagliflozin once again confirms the positive effect of the drug on the renal tubules. Our observations show that the use of sodium-glucose cotransporter type 2 inhibitors is advisable in chronic heart failure caused by rheumatic heart disease. Because they affect the proximal renal tubules, which leads to a decrease in the KIM-1 protein secreted by them.

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