21. USE OF SODIUM-GLUCOSE COTRANSPORTER 2 INHIBITORS IN HEART FAILURE

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Introduction. Heart failure syndrome has been designated as a major clinical and public health problem. Ischemic cardiopathy, arterial hypertension, cardiomyopathies, myocarditis, pericarditis valvulopathies, arrhythmias, toxic conditions and diabetes are considered the most common causes of heart failure (HF). Angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, diuretics, calcium channel blockers and beta adrenoblockers are recommended as first-line medications in the treatment of HF. Recent research has shown that sodium-glucose cotransporter 2 inhibitors (SGLT2-empagliflozin, dapagliflozin, and canagliflozin) have shown favorable effects in patients with HF.

Aim of study. The study's aim was to elucidate the mechanisms and effects of SGLT2 responsible for the efficacy in heart failure.

Methods and materials. A review was performed in the PubMed database of scientific articles reflecting the efficacy of SGLT2 inhibitors in HF by using the keywords "heart failure" and "sodium-glucose cotransporter 2 inhibitors".

Results. It has been suggested that SGLT2 inhibitors, simultaneously with the antihyperglycemic effect, may manifest cardioprotective and renoprotective effects in patients with HF, along with or without diabetes mellitus. These effects can be determined by: 1) inhibition of the glucose and sodium reabsorption with weight loss and a natriuresis, which reduces the volume of circulating blood, pre - and post-pregnancy; 2) blocking of the hydrogen and sodium reabsorption in the proximal tubules with the elimination of natrium and preservation of renal perfusion, as well as a decrease in cardiomyocytes and prevention of cardiomyocyte death; 3) annihilation of oxidative stress by direct action (SGLT2 and SGLT1 inhibition) and indirect (improvement of glycemic control); 4) improvement of vascular function by reducing activation and dysfunction of endothelial cells and direct vasodilation; 5) reduction of the sympathetic nervous system hyperactivity with the decrease of arterial stiffness, endothelial dysfunction and alteration of renal hydroelectrolytic balance; 6) modulation of the activity of the renin-angiotensin-aldosterone system.

Conclusion. SGLT2 inhibitors will show beneficial influences on the pathogenetic links of heart failure with the reduction of hospitalizations and mortality of patients with HF. Through the pleiotropic effects, SGLT2 inhibitors will contribute to advantageous hemodynamic and metabolic effects in patients with kidney and heart diseases, and diabetes.

Keywords. Heart failure, sodium-glucose cotransporter 2 inhibitors, dapagliflozin, empagliflozin.