CARDIORENAL INTERACTIONS IN HYPERTENSIVE PATIENTS WITH CHRONIC KIDNEY DISEASE

Sitora Ismoilova
MASTER'S STUDENT DEPARTMENT OF «INTERNAL MEDICINE NEPHROLOGY AND HEMODIALYSIS» TASHKENT STATE MEDICAL UNIVERSITY
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Annotation. Arterial hypertension (AH) is a major contributor to cardiovascular morbidity in patients with chronic kidney disease (CKD). Progressive renal dysfunction promotes cardiac remodeling and left ventricular diastolic dysfunction, ultimately leading to the development of cardiorenal syndrome. Early identification of combined cardiac and renal impairment requires integrated assessment of cardiorenal parameters.

Objective: To assess cardiac and renal parameters in hypertensive patients across different stages of chronic kidney disease.

Methods. This study included 90 patients with arterial hypertension, divided into three groups according to CKD stage: stage 2 (n = 30), stage 3 (n = 30), and stage 4 (n = 30). All patients underwent transthoracic echocardiography to evaluate left ventricular diastolic function, including E/A ratio, septal and lateral e′ velocity, E/e′ ratio, left atrial volume index (LAVI), and left ventricular mass index (LVMI). Renal function was assessed using serum creatinine, urea, estimated glomerular filtration rate (eGFR), and proteinuria. Comparative and correlation analyses were performed.

Results. Renal function progressively deteriorated with advancing CKD stage, with mean eGFR values of 68.4 ± 6.2, 41.7 ± 5.8, and 22.3 ± 4.9 ml/min/1.73 m^2 in CKD stages 2, 3, and 4, respectively ($p < 0.001$). Serum creatinine, urea, and proteinuria levels increased significantly across groups. Echocardiographic assessment revealed worsening left ventricular diastolic function, characterized by a reduction in e′ velocity and a significant increase in the E/e′ ratio (9.1 ± 2.3 vs. 13.6 ± 3.1 vs. 17.8 ± 3.9; $p < 0.001$), as well as an increase in left atrial volume index. Proteinuria demonstrated a moderate positive correlation with the E/e′ ratio ($r = 0.48$, $p < 0.01$).

Conclusion. In patients with arterial hypertension and chronic kidney disease, progressive renal dysfunction is closely associated with impaired left ventricular diastolic function and elevated filling pressures. Combined echocardiographic and biochemical assessment represents a valuable approach for early detection and evaluation of cardiorenal involvement.

Keywords: arterial hypertension; chronic kidney disease; cardiorenal syndrome; diastolic dysfunction; echocardiography.

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