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Comparison of β -blocker with other anti-hypertensive drugs in Chronic Kidney Disease Patients: A Nationwide Health Insurance Data

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Objectives : Chronic kidney disease (CKD) is strongly associated with an increased risk of cardiovascular disease (CVD). While β -blockers are widely used for CVD management, their effectiveness in CKD patients without pre-existing CVD remains unclear. This study evaluates the clinical impact of β -blocker use in this population, utilizing data from the Korean National Health Insurance Service (NHIS).

Methods : This nationwide cohort study included CKD patients with an estimated glomerular filtration rate (eGFR) < 60 mL/min/1.73m² on at least two occasions (2012–2015). Patients with a history of dialysis, kidney transplantation, or CVD were excluded. 1:2 propensity score matching was performed to balance baseline characteristics, and time-varying Cox models were applied. Clinical outcomes included all-cause mortality and 4-point major adverse cardiovascular events (MACE), comprising cardiovascular death, myocardial infarction, stroke, and hospitalization for heart failure.

Results : Among 325,584 CKD patients, 92,601 met the inclusion criteria, and 9,557 were prescribed β -blockers. In the propensity-matched cohort, β -blocker use was associated with a higher risk of all-cause mortality (hazard ratio [HR], 1.198; 95% confidence interval [CI], 1.119–1.281) and MACE (HR, 1.290; 95% CI, 1.224–1.359) in CKD patients, with all four MACE components showing elevated risks. Among β -blockers, carvedilol showed a higher risk for both mortality and MACE compared to other β -blockers.

Conclusions : Our findings suggest that β -blockers may not provide the expected benefits in CKD patients without pre-existing CVD, as their use was linked to increased risks of mortality and 4-point MACE. These results challenge the conventional role of β -blockers in this population and underscore the need for a more tailored approach to antihypertensive therapy in CKD.