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Salt intake and the progression of chronic kidney disease

Chun Soo Lim

Seoul National University, Seoul, Korea

Chronic kidney disease (CKD) is a significant global public health problem with poor prognosis and
elevated health care costs. Increased urinary protein excretion is a major determinant of progressive renal function loss in patients CKD. Studies in CKD patients with and without diabetes showed that renoprotective treatments limit GFR decline and progression to end-stage renal disease (ESRD) to the extent they lower proteinuria, independent of BP control. These findings imply that urinary proteins should be reduced as far as possible to lower than 1 g/day. Inhibitors of the renin-angiotensin system, such as angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs), are the antihypertensive drugs that most effectively reduce urinary proteins and slow GFR decline in patients with CKD. The efficacy of treatment, however, is heterogeneous and dependent on inborn and environmental factors. Increased dietary sodium intake increases proteinuria and accelerates renal disease progression. Furthermore, high sodium intake is known to limit the antihypertensive and antiproteinuric effects of ACE inhibitors and ARBs in patients with CKD. The increase in daily urinary sodium excretion increases the risk of ESRD. Sodium overload increases ACE activity in renal and vascular tissues, which enhances vascular conversion of AngI to AngII and blunts the effects of ACE inhibition in animal experiments and humans with high sodium intake. Independent of BP control, enhanced intrarenal ACE activity has been associated with accelerated renal damage in several experimental models of CKD and might explain at least part of the excess proteinuria and renal risk associated with high sodium intake. In ESPECIAL (effects of low sodium intake on the anti-proteinuric efficacy of olmesartan in hypertensive patients with albuminuria) study, the 24-hour urinary albumin excretion was decreased more in patients in the intensive low-salt diet education group than patients in the conventional education group. Weekly intensive education on a low salt diet would be a suitable method for clinical practice.