



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

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Cardiovascular Health Profile and Long-Term Risk of End-Stage Kidney Disease: A Nationwide Population-Based Study

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Objectives : Cardiometabolic and lifestyle factors captured by composite cardiovascular health metrics may identify individuals at elevated long-term risk of end-stage kidney disease (ESKD) before clinically apparent chronic kidney disease (CKD). We investigated the association between a Asian Life's Simple Score (ALSS), adapted from the American Heart Association's Life's Simple 7 (LS7), and incident ESKD in a large population-based cohort.

Methods : We analyzed 6,844,647 Korean adults free of kidney failure at baseline. ALSS (0–12), a modified LS7 excluding diet with Asian-specific criteria, was categorized into quartiles (Q1–Q4; Q4 reference). Incident ESKD was identified during follow-up. Associations between baseline ALSS and incident ESKD were evaluated using Cox models with age- and sex-stratified analyses.

Results : Over a median follow-up of 13.0 years (IQR, 12.3–13.4), 35,457 participants developed incident ESKD (incidence rate 0.41 per 1000 person-years). ESKD incidence increased stepwise with lower ALSS (0.10 per 1000 person-years in Q4 vs 0.76 in Q1). Compared with Q4, the adjusted hazard ratios were 3.29 (95% CI, 3.13–3.46) for Q1, 1.85 (1.76–1.95) for Q2, and 1.36 (1.28–1.44) for Q3 (P for trend <0.001). A significant interaction by age was observed (P for interaction <0.001): HRs for Q1 versus Q4 were 5.65 (5.14–6.20) in those aged <50 years and progressively attenuated with age to 2.53 (2.27–2.81) in those aged ≥70 years, despite higher absolute incidence in older adults. Women showed stronger relative associations than men (Q1 vs Q4: 4.49 [4.18–4.83] vs 3.34 [3.11–3.59]), with the highest relative risk among women aged <50 years (8.74 [7.67–9.95]).

Conclusions : Lower ALSS was independently and dose-dependently associated with incident ESKD in a large general population, with the greatest proportional impact in younger adults—particularly women aged <50 years—while absolute burden remained highest in older adults. Composite cardiovascular health metrics may complement CKD-based risk tools by enabling upstream, age- and sex-specific prevention of kidney failure.