



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

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Smoking cessation duration and risk of acute kidney injury: a nationwide cohort study in Korea

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Objectives : Smoking is a modifiable risk factor for kidney disease, but the degree to which smoking cessation reduces acute kidney injury (AKI) and AKI requiring kidney replacement therapy (AKI-KRT) remains unclear. This study evaluated whether the duration of smoking cessation is associated with AKI and AKI-KRT outcomes.

Methods : Using the Korean National Health Insurance Service database (2002–2023), we included 1,151,722 adults with at least four national health examinations: 885,299 never smokers, 55,391 quitters, and 211,032 current smokers. Smoking status was time-updated, and cessation duration was grouped in 2-year intervals. Incident AKI (ICD-10 N17) and AKI-KRT were identified through claims data. Multivariable Cox models estimated adjusted hazard ratios (HRs) across cessation-duration groups, using current and never smokers as reference categories. Sex-stratified subgroup analyses were performed to examine differential effects in men and women.

Results : Among 11,972 AKI events and 637 AKI-KRT events, quitters with <2 years of cessation had the highest AKI incidence, declining progressively with longer cessation duration. Using current smokers as reference, adjusted HRs decreased progressively with longer cessation duration. For AKI-KRT, only never smokers showed significantly reduced risk, although quitters exhibited a similar downward trend. Patterns were consistent in men; estimates for women were imprecise due to few events. Approximately 6–7 years of sustained abstinence was needed to approach the risk of never smokers.

Conclusions : Sustained smoking cessation was associated with a progressive decline in AKI risk, with 6–7 years of abstinence needed to approach the risk comparable to those of never smokers. Findings support long-term cessation as an important kidney-protective strategy.

KSN_AKI Table.png



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Table. HR and 95% CI for acute kidney injury and acute kidney injury requiring kidney replacement therapy according to smoking status and duration of smoking cessation with reference to current smokers.

Outcome		Unadjusted model	Adjusted model
AKI	Smoking status	HR (95% CI)	HR (95% CI)
	Current smokers	1.000 (reference)	1.000 (reference)
	Quit <2 years	1.028 (0.905–1.168)	0.790 (0.695–0.898)
	Quit 2–3 years	1.020 (0.873–1.191)	0.831 (0.711–0.971)
	Quit 4–5 years	0.786 (0.633–0.977)	0.644 (0.518–0.801)
	Quit 6–7 years	0.717 (0.536–0.960)	0.607 (0.453–0.813)
	Quit ≥8 years	0.578 (0.404–0.829)	0.574 (0.401–0.823)
	Never smokers	0.841 (0.804–0.879)	0.639 (0.602–0.677)
AKI-KRT	Smoking status	Unadjusted model	Adjusted model
		HR (95% CI)	HR (95% CI)
	Current smokers	1.000 (reference)	1.000 (reference)
	Quit <2 years	1.327 (0.850–2.071)	1.059 (0.677–1.655)
	Quit 2–3 years	0.738 (0.363–1.500)	0.615 (0.302–1.253)
	Quit 4–5 years	0.863 (0.382–1.950)	0.733 (0.324–1.657)
	Quit 6–7 years	0.480 (0.119–1.935)	0.411 (0.102–1.657)
	Quit ≥8 years	0.892 (0.285–2.796)	0.885 (0.282–2.777)
	Never smokers	0.629 (0.525–0.753)	0.520 (0.406–0.666)

Adjusted models were adjusted for age, sex, body mass index, systolic blood pressure, fasting blood glucose, γ -GTP, eGFR, total cholesterol, alcohol consumption, pack-years, exercise, hypertension, diabetes mellitus and dyslipidemia.
AKI, acute kidney injury; AKI-KRT, acute kidney injury requiring kidney replacement therapy; CI, confidence interval; eGFR, estimated glomerular filtration rate; γ -GTP, γ -glutamyl transpeptidase; HR, hazard ratio.