



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

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Extreme heat exposure and all-cause mortality in chronic kidney disease: A nationwide time-stratified case-crossover study of more than one million patients

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Objectives : Chronic kidney disease (CKD) imposes a global public health burden and is known to be affected by environmental stress. Although extreme heat exposure is a risk factor for CKD, the short-term heat effects in patients with CKD are unclear. We examined the association between ambient heat exposure and mortality in CKD patients.

Methods : This nationwide, bidirectional, time-stratified case-crossover study used National Health Insurance Service (NHIS) data from Korea. Using daily district-level mean temperatures, associations with all-cause mortality were estimated with distributed lag nonlinear models (DLNMs; lags 0–6) within conditional logistic regression. Effects, summarized as odds ratios (ORs), compared the 99th percentile temperature (extreme heat) to the 75th percentile temperature (moderate heat). Subgroup and sensitivity analyses assessed effect modification and robustness.

Results : During follow-up, 223,949 and 178,878 deaths occurred in the CKD group and matched non-CKD groups, respectively. Extreme heat was associated with increased mortality risk in the CKD group (OR 1.041; 95% CI 1.002–1.081; $p=0.041$). The CKD group had a more nuanced risk (relative OR 1.044; 95% CI 0.980–1.112; interaction $p=0.107$). Subgroup analyses indicated significant differences among women, elderly individuals, non-Medical Aid recipients, and those with hypertension.

Conclusions : Short-term extreme heat exposure is associated with increased mortality in patients with CKD, with heightened vulnerability in specific subgroups. These findings highlight the need for targeted preventive strategies in the CKD population.

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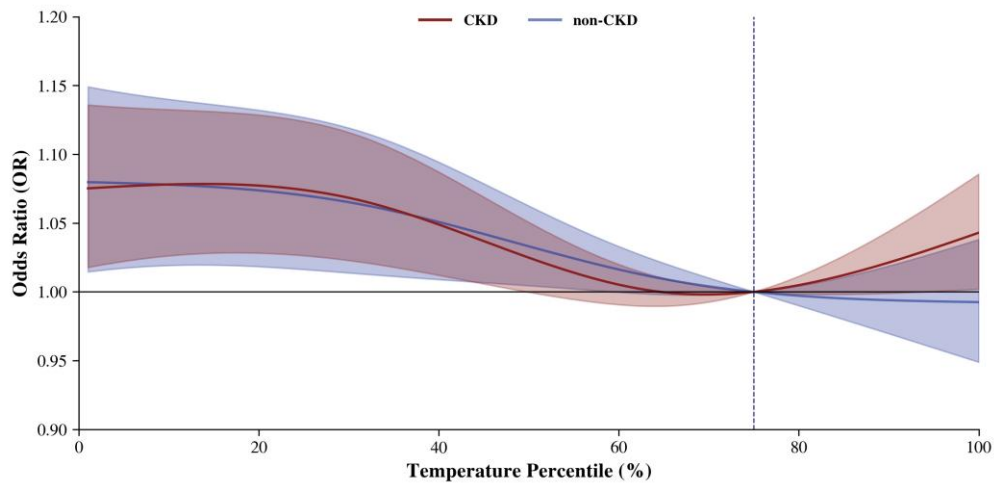
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