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Long-term exposure to high perceived temperature and risk for mortality among CKD patients

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Objectives: Risks for climate change is happening and interest in health risks from high temperature exposure is growing. The Perceived Temperature (PT) is an equivalent temperature based on a complete heat budget model of the human body. We aimed to analyze the effect of PT on the overall mortality among chronic kidney disease (CKD) patients.

Methods: A total of 32,870 patients with CKD in Seoul participated in a retrospective cohort (2001-2018) at three medical centers. Perceived temperature during summer season (from July to September, at each year) was calculated using various climate factors including air temperature nearby automated weather station, dew point temperature, wind velocity, height of anemometer above ground, and total cloud amount. We assessed the association of PT using inverse distance weighting (IDW) on mortality in CKD patients in the Cox proportional hazard model that was adjusted for sex, age, body mass index, eGFR, hypertension, and diabetes mellitus.

Results: During the 6.14±3.96 years, 3,863 deaths (13%) were observed. We confirmed the significant effects of PT (average PT: hazard ratio [HR] 1.21, 95% confidence interval [CI] 1.18-1.23; minimum PT: HR 1.02, 95% CI 1.00-1.05; maximum PT: 1.20, 95% CI 1.18-1.22) on mortality in CKD patients in univariable analysis. In multivariable analysis, average PT (HR 1.22, 95% CI 1.19-1.25) and maximum PT (HR 1.20, 95% CI 1.17-1.23) showed increased risk for overall mortality among CKD patients

Conclusions: Long-term exposure to high perceived temperature during summer season increases the risk of mortality among CKD patients.