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eGFR Level and Its Past Trajectory for Risk of Progression to End-Stage Renal Disease: Meta-Analysis of 22 Cohorts in the CKD Prognosis Consortium

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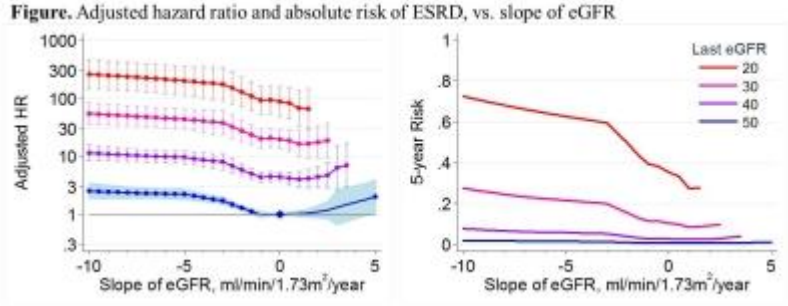
BACKGROUND: The level of eGFR is a potent predictor of risk for progression to end-stage renal disease (ESRD). In practice, rate of progression is inferred from the past trajectory (slope) of eGFR decline. It is unclear how much prognostic information is provided by the current eGFR vs. the past slope.

METHODS: Slopes were estimated from all eGFR values in a 3-year baseline period of 13 CKD and 9 general/high-risk cohorts. We modeled the hazard ratios (HRs) of subsequent ESRD as a spline function of eGFR slopes after adjusting for age, sex, race, last eGFR, and co-morbid conditions compared to no eGFR decline. We used random effects meta-analyses to combine results across studies, stratified by type of cohort. We calculated the absolute risk of ESRD at 5 years after the last eGFR period using the weighted average baseline risk.

RESULTS: 1,080,221participants experienced 5,159 ESRD events during a mean follow-up period of 2.0 years after the baseline period. In CKD cohorts the last eGFR was associated with a stronger HR than past decline (Figure, left panel), but both contributed substantially to the absolute risk of ESRD (Figure, right panel). Similar results were observed in the general/high risk cohorts. Results were similar when using different baseline periods for slope assessment and when adjusting for last albuminuria.

Figure. Adjusted hazard ratio and absolute risk of ESRD, vs. slope of eGFR



CONCLUSIONS: Risk of progression to ESRD is primarily associated with the current eGFR, but past slopes of eGFR decline can add further detail to risk assessment.