DECLINE IN ESTIMATED GLOMERULAR FILTRATION RATE AND SUBSEQUENT RISK OF MORTALITY: A META-ANALYSIS OF 35 COHORTS IN THE CKD PROGNOSIS CONSORTIUM

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INTRODUCTION: Change in estimated GFR (eGFR) is frequently used to track CKD progression in clinical practice, trials and cohort studies but its association with mortality has not been studied extensively.

METHODS: Change in eGFR was estimated as % change from the first to last eGFR (CKD-EPI creatinine) in a 2-year baseline period. We modeled the hazard ratios (HRs) of subsequent mortality as a spline function of % change in eGFR after adjusting for age, sex, race, first eGFR, and co-morbid conditions. We used random effects meta-analyses to combine results stratified by first baseline eGFR (<60 & ≥60) across studies.

RESULTS: Mortality follow-up of 1,597,723 participants from 32 cohorts for a mean of 3.7 years after the 2-year baseline period showed 101,120 deaths for baseline eGFR <60 (n=395,394) and 57,472 deaths for baseline eGFR ≥60 (n=1,202,329). Change in eGFR had a non-linear association with mortality (Figure for eGFR<60). A decline in eGFR was consistently associated with higher subsequent mortality risk (adjusted HR for -30% vs. 0% change in eGFR were: 1.8 at eGFR <60; and 1.6 at eGFR ≥60; p<0.001). Similar results were obtained for a 1- or 3-year change in eGFR. Hazards ratios were largely similar for those with eGFR ≥60 or when stratified by ACR levels.

CONCLUSIONS: Declines in eGFR are strongly and consistently associated with subsequent risk of mortality adjusted for the first eGFR and covariates. These findings support using smaller changes than -57% (equivalent to doubling of serum creatinine) in clinical research.