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The difference between cystatin C- and creatinine-based estimated glomerular filtration rate and incident atrial fibrillation in the UK Biobank

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Objectives: Recent studies showed that a lower difference between cystatin C- and creatinine-based estimated glomerular filtration rate (eGFR) is associated with a higher risk of adverse outcomes, such as cardiovascular disease, hospitalization, and mortality. However, the relation between these differences and the development of atrial fibrillation (AF) is not well known.

Methods: Participants from UK Biobank without prior or concurrent AF and with serum creatinine and cystatin C measurements at baseline were included in this study. The primary exposure was the difference between two eGFR estimates ($eGFR_{diff}$), subtracting creatinine-based eGFR from cystatin C-based eGFR, and the primary outcome was incident AF. The subdistribution hazard model was used to assess the association of $eGFR_{diff}$ with incident AF and all-cause death was treated as competing risk.

Results: Of 340,143 participants, 179,055 (52.6%) were female, and the mean (SD) age was 56.2 (81) years. During a median follow-up of 11.7 years, incident AF occurred in 17,843 (5.2%) participants. Participants with higher $eGFR_{diff}$ were younger, and had better metabolic profiles and functional status. In the multivariate-adjusted model, compared to participants with midrange $eGFR_{diff}$ (-15 to 15 mL/min/1.73 m^2), participants with the negative $eGFR_{diff}$ (<-15 mL/min/1.73 m^2) had a higher risk of incident AF (subdistribution hazard ratio [sHR], 1.26; 95% confidence interval [CI], 1.21-1.31), while participants with the positive $eGFR_{diff}$ (≥15 mL/min/1.73 m^2) category had a lower risk of AF (sHR, 0.82; 95% CI, 0.77-0.88). In the adjusted model treating $eGFR_{diff}$ as a continuous variable, a 10 mL/min/1.73 m^2 increase in $eGFR_{diff}$ was associated with a 0.90-fold decreased risk of AF development (sHR, 0.90; 95% CI, 0.88-0.91).

Conclusions: This study showed that a larger $eGFR_{diff}$ is associated with a lower risk of AF.

Table 1. Baseline characteristics