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Performance of the new race-free estimated glomerular filtration rate equations among live kidney donors in Asian population

SeongWook Shin¹, Juhan Lee²

¹Department of Surgery, Division of Transplant Surgery, Keimyung University Dongsan Medical Center, Republic of Korea

²Department of Surgery, Division of Transplant Surgery, Severance Hospital, Yonsei University, Republic of Korea

Introduction:

The new Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) and European Kidney Function Consortium (EKFC) estimated glomerular filtration rate (GFR) equations without a race coefficient have been developed. However, their performance in healthy Asian populations, particularly in live kidney donors, has not been thoroughly investigated.

Methods:

In this cross-sectional analysis, we examined 705 adult live kidney donors who underwent donor nephrectomy between 2016 and 2021. Serum creatinine, cystatin C, and GFR measurements using radiolabeled diethylenetriaminepentaacetic acid (DTPA) were collected. We compared the performance of the 2009, 2012, and 2021 CKD-EPI and EKFC estimated GFR equations utilizing serum creatinine and/or cystatin C with the measured GFR using DTPA in terms of bias, precision, and accuracy

Results: The 2009 and 2021 CKD-EPI equations using serum creatinine demonstrated comparable median bias (9.6 vs 6.6 mL/min/1.73 m, respectively), precision (18.7 vs 17.5 mL/min/1.73 m, respectively), and accuracy (P10/P20, 38.2%/30.1% vs. 35.6%/28.3%). Similarly, the 2012 and 2021 CKD-EPI estimated GFR equations using serum creatinine and cystatin C showed comparable median bias (8.1 vs 4.8 mL/min/1.73 m, respectively), precision (17.6 vs 18.4 mL/min/1.73 m, respectively), and accuracy (P10/P20, 38.4%/29.2% vs. 37.4%/27.6%). The new CKD-EPI eGFR equations were less biased and showed better precision and accuracy compared to EKFC equations.

Conclusion: The new race-free CKD-EPI and EKFC estimated GFR equations demonstrated similar performance to previous CKD-EPI equations in healthy Asian cohorts, specifically in kidney donors. Although not statistically significant, the 2021 CKD-EPI GFR equation using serum creatinine and cystatin C showed better improved accuracy, precision, and accuracy compared to other equations.