Association between vascular access creation and deceleration of estimated glomerular filtration rate decline in late-stage chronic kidney disease patients transitioning to end-stage renal disease.

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Abstract

BACKGROUND: Prior studies have suggested that arteriovenous fistula (AVF) or graft (AVG) creation may be associated with slowing of estimated glomerular filtration rate (eGFR) decline. It is unclear if this is attributable to the physiological benefits of a mature access on systemic circulation versus confounding factors.

METHODS: We examined a nationwide cohort of 3026 US veterans with advanced chronic kidney disease (CKD) transitioning to dialysis between 2007 and 2011 who had a pre-dialysis AVF/AVG and had at least three outpatient eGFR measurements both before and after AVF/AVG creation. Slopes of eGFR were estimated using mixed-effects models adjusted for fixed and time-dependent confounders, and compared separately for the pre- and post-AVF/AVG period overall and in patients stratified by AVF/AVG maturation. In all, 3514 patients without AVF/AVG who started dialysis with a catheter served as comparators, using an arbitrary 6-month index date before dialysis initiation to assess change in eGFR slopes.

RESULTS: Of the 3026 patients with AVF/AVG (mean age 67 years, 98% male, 75% diabetic), 71% had a mature AVF/AVG at dialysis initiation. eGFR decline accelerated in the last 6 months prior to dialysis in patients with a catheter (median, from -6.0 to -16.3 mL/min/1.73 m²/year, P < 0.001), while a significant deceleration of eGFR decline was seen after vascular access creation in those with AVF/AVG (median, from -5.6 to -4.1 mL/min/1.73 m²/year, P < 0.001). Findings were independent of AVF/

CONCLUSIONS: The creation of pre-dialysis AVF/AVG appears to be associated with eGFR slope deceleration and, consequently, may delay the onset of dialysis initiation in advanced CKD patients.

Published by Oxford University Press on behalf of ERA-EDTA 2016. This work is written by US Government employees and is in the public domain in the US.

KEYWORDS: arteriovenous access; chronic kidney disease; eGFR decline; hemodialysis

PMID: 27242372  PMCID: PMC5837412 [A]  lable on 2018-08-01  DOI: 10.1093/ndt/gfw220