

UC Irvine

UC Irvine Previously Published Works

Title

The role of race in survival among patients undergoing dialysis.

Permalink

<https://escholarship.org/uc/item/8pk1867c>

Journal

Nephrology News & Issues, 25(13)

ISSN

0896-1263

Authors

Norris, Keith C
Kalantar-Zadeh, Kamyar
Kopple, Joel D

Publication Date

2011-12-01

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed



Published in final edited form as:

Nephrol News Issues. 2011 December ; 25(13): 13–16.

The role of race in survival among patients undergoing dialysis

Keith C Norris, MD, Kamyar Kalantar-Zadeh, MD, MPH, PhD, and Joel D Kopple, MD and **Dr. Kalantar-Zadeh** are with the Charles R. Drew University of Medicine and Science and the David Geffen School of Medicine and School of Public Health at the University of California, Los Angeles. **Drs. Kalantar-Zadeh** and **Dr. Kopple** are with the Harold Simmons Center for Chronic Disease Research and Epidemiology, and the Division of Nephrology and Hypertension, Los Angeles Biomedical Research Institute at Harbor-UCLA Medical Center, Torrance, Calif

A survival paradox has been widely known to exist for minority patients receiving maintenance hemodialysis (mHD) by most, but not all studies.¹ This is particularly noteworthy for the African-American community that suffers from markedly lower survival rates than the general population, in stark contrast to mHD African Americans who enjoy better age- and gender-adjusted survival rates than their white counterparts.² A recent report by Kucirka et al. cited a commonly described survival advantage for black mHD patients applied only to those older than 50 years and that younger black mHD patients actually had higher mortality than their white counterparts.³ This was the first detailed look at adjusted end-stage renal disease mortality by race across different age ranges.

Since this “new” finding was not previously noted, the renal community initially believed this was an aberration. It had been understood that black mHD patients have always had a better survival rate than whites. Kucirka and colleagues looked at over 1.3 million mHD patients with a median follow up of 6.7 years, in contrast to many prior studies that looked at 200,000 or fewer mHD patients followed for 1–6 years.^{4–7} In those prior studies, insufficient data in the mortality event rate, particularly for the younger groups where the death rate is not as high, may have made it difficult to make subgroup conclusions. However, the analysis by Kucirka et al. of a more robust data set suggests such findings may have been there from the start if additional subgroup analyses had been performed. Thus, these “new” findings may not be so “new” after all.

What we do know

We recently examined 2,892 persons with chronic kidney disease from a National Health and Nutrition Examination Survey (NHANES) III mortality follow-up survey to explore potential pre-ESRD racial/ethnic differences in mortality.⁸ After adjusting for age and gender, African Americans with CKD had a significantly higher risk for all cause death that was modified by age. Specifically, African Americans who were younger than 65 years of age were 78% more likely to die than white individuals, whereas no significant differences in mortality were observed among individuals who were greater than 65 years of age. No differences were seen for Hispanics in comparison to whites, although there was a trend toward findings more similar to that of African Americans. Adjustment for cardiovascular risk factors and CKD stage did not materially change the results, but the hazard ratios were significantly attenuated after adjustment for socioeconomic factors. It may have seemed

intuitive to surmise that any survival advantages conferred to mHD African American patients, by survival bias or other, would be most pronounced in those older than 65 years of age and that the dramatically higher death rate for younger mHD African American patients might be attenuated, but not reversed.

We also recently reported findings from five-year survival data in more than 124,000 mHD patients that showed blacks and Hispanics had lower unadjusted all-cause mortality than non-Hispanic whites.⁵ Those findings persisted after traditional case-mix adjustment and were consistent with much of the previously reported literature. We did not examine across age groups, but we did find that after further adjustments for surrogates of the malnutrition-inflammation complex syndrome, Hispanics had mortality similar to non-Hispanic whites, and African Americans had even higher mortality. These findings suggested the racial/ethnic differences in survival among hemodialysis patients is due in part to a more favorable nutritional/inflammatory profile and that with adjustment for key confounders the adjusted survival advantage for Hispanics and African Americans may disappear. In other words, the survival advantage may be real, but we can explain it by socioeconomic and/or nutritional/inflammatory factors, reinforcing the importance of these variables in focusing our investigations into improving survival for all mHD patients.

However, the above issues are still unlikely to fully account for the findings by Kucirka et al. Likewise, how is it that the renal community did not notice such striking age-related mortality differences in mHD patients? And equally or possibly more important, can we speculate why the mortality risk is higher for younger African-American mHD patients? African Americans could be steered away from transplants because it is perceived their mortality risk is lower on dialysis. This could create a bias against survival rates. Also, there has been a fall in the death rate among mHD patients, specifically with a noted decline in the cardiovascular death rate since 2004. This is hypothesized to be attributed, in large part, to the increased use of cardioprotective agents such as beta blockers (60%) and ACEI/ARB (50%) being administered fairly evenly across all age groups and racial/ ethnic groups.⁹ If this were in fact a major contributor to improved survival, then the reduction in CV deaths among younger HD patients would disproportionately enhance the relative impact of non-CV deaths. This would preferentially favor overall survival improvements in young White mHD patients since young minorities (age 22–45) are even more likely to die of homicide, motor vehicle accident, suicide and drug overdose, than their white counterparts.¹⁰

In addition to the similar background disparity in the general population, where younger otherwise healthy African Americans have shorter life expectancy than their white counterparts,² differences in insurance mix could have a role in that younger black dialysis patients are more likely to be un- or under-insured, whereas in older patients there is more parity due to increased rates of Medicare coverage.⁹ Moreover, a large subset of young black mHD patients with hypertensive nephrosclerosis may have substance abuse and/or associated high risk lifestyle activities that would predispose to early death, despite increased pharmacologic intervention.¹¹

Since the median age of incident mHD patients in most countries including the United States is above 60 years,⁹ only a modest proportion of mHD patients are young. However, the large

sample size in the Kucirka et al. analysis may have allowed a greater ability to detect changes within this younger cohort. While the applicability of these findings may be somewhat limited because most HD patients are older than 50 years, this is still an important group of ESRD patients with the potential for longer survival, rehabilitation, and advancing our overall understanding of mortality/survival both in ESRD and across race/ethnicity. Recent studies have found that a favorable nutritional/inflammatory profile, including larger muscle mass, may explain the survival advantages of blacks,⁵ whereas higher doses of active vitamin D, derived from higher PTH levels in black dialysis patients, may be another important mechanism.¹² Other potential causes of better survival of blacks include favorable coping mechanisms and starker social-mental support among black communities upon dealing with conditions that would be considered much more devastating by other subcultures.^{7,12} We have reported a similar survival paradox among Israeli dialysis patients, in whom Israeli Arabs have greater survival than Jews, while transplant rates are somewhat similar between the two groups.⁷ While we did not examine differences across older and younger patient subsets in that analysis, we developed a theoretical framework to describe the potential mechanism(s) leading to survival disparities of dialysis patients (see Figure 1).

Conclusion

Rather than dismissing the findings of Kucirka et al. as an aberration or related solely to differences in approaches to statistical modeling or residual confounders, we believe that their report should be viewed as a stimulus to promote a better understanding of the roots of racial/ethnic survival differences across age and disease, such that we may further help improve outcomes of both patients with kidney diseases and other individuals with chronic disease states or conditions.

Acknowledgments

Keith Norris is supported in part by the NIH grants U54 RR026138 and P20 MD00182. Kamyar Kalantar-Zadeh is supported in part by the NIH grants (R01 DK078106, K24 xxxxxx, the American Heart Association (0655776Y), DaVita Clinical Research, and Harold Simmons.

References

1. Robinson BM, et al. Revisiting Survival Differences by Race and Ethnicity among Hemodialysis Patients: The Dialysis Outcomes and Practice Patterns Study. *J Am Soc Nephrol.* 2006; 17:2910–2918. [PubMed: 16988065]
2. Jolly S, Vittinghoff E, Chattopadhyay A, et al. Bibbins-Domingo K. Higher cardiovascular disease prevalence and mortality among younger blacks compared to whites. *Am J Med.* 2010; 123:811–818. [PubMed: 20800150]
3. Kucirka LM, Grams ME, Lessler J, et al. Association of race and age with survival among patients undergoing dialysis. *JAMA.* Aug 10; 2011 306(6):620–626. [PubMed: 21828325]
4. Noori N, Kovesdy CP, Dukkupati R, Feroze U, Molnar MZ, Bross R, Nissenson AR, Kopple JD, Norris KC, Kalantar-Zadeh K. Racial and ethnic differences in mortality of hemodialysis patients: Role of dietary and nutritional status and inflammation. *Am J Nephrol.* 2011 Feb 4; 33(2):157–167. [PubMed: 21293117]
5. Wolf M, Betancourt J, Chang Y, Shah A, Teng M, Camargo CA, Melamed M, Norris K, Stampfer MJ, Powe NR, Thadhani R. Impact of Activated Vitamin D and Race on Survival among Hemodialysis Patients. *J Am Soc Nephrol.* 2008; 19:1379–1388. [PubMed: 18400938]

6. Streja E, Kovesdy CP, Molnar MZ, Norris KC, Greenland S, Nissenson AR, Kopple JD, Kalantar-Zadeh K. Role of nutritional status and inflammation in higher survival of African American and Hispanic hemodialysis patients. *Am J Kidney Dis.* Jun; 2011 57(6):883–893. [PubMed: 21239093]
7. Kalantar-Zadeh K, Golan E, Shohat T, Streja E, Norris KC, Kopple JD. Survival Disparities within American and Israeli Dialysis Populations: Learning from Similarities and Distinctions across Race and Ethnicity. *Semin Dial.* Nov; 2010 23(6):586–594. [PubMed: 21175833]
8. Mehrotra R, Kermah D, Fried L, Adler S, Norris K. Racial Disparities in Mortality Outcomes in Chronic Kidney Disease. *J Am Soc Nephrol.* 2008 Jul; 19(7):1403–10. [PubMed: 18385428]
9. US Renal Data System. *USRDS 2010 annual data report: atlas of end-stage renal disease in the United States.* National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Disease; Bethesda, MD: 2010.
10. *Mortality In Los Angeles County 2003: Leading Causes Of Death And Premature Death.* Los Angeles County Department of Public Health; Jul. 2006
11. Norris KC, Thornhill-Joynes M, Robinson C, Strickland T, Alperson BL, Witana SC, Ward HJ. Cocaine use, hypertension and end-stage renal disease. *Am J Kidney Dis.* 2001; 38(3):523–528. [PubMed: 11532684]
12. Kalantar-Zadeh K, Miller JE, Kovesdy CP, et al. Impact of race on hyper-parathyroidism, mineral disarrays, administered vitamin D mimetic, and survival in hemodialysis patients. *J Bone Miner Res.* Dec; 2010 25(12):2448–2458.

Key points and action steps

- African Americans are at increased risk for premature cardiovascular and related events including CKD
- The paradoxical increased survival of African Americans on hemodialysis is mainly observed in older African Americans and may be related to a survival bias for those with a favorable nutritional/inflammatory profile, adaptive personal/familial/community coping mechanisms in response to a chronic illness, and/or other factors.
- Chronic kidney disease progression in many African Americans can be effectively prevented and/or attenuated by appropriate control of blood pressure, proteinuria and/or blood glucose control, however, a subset progress despite evidence-based therapy to target goals maybe related to a greater prevalence of the APOL1 gene.
- No clinically relevant ethnic differences in outcomes have been noted in patients with hypertension and CKD following most randomized controlled pharmacologic interventions for blood-pressure control. The paucity of data with adequate numbers of minority participants reinforces the need to achieve greater ethnic diversity in clinical trials.

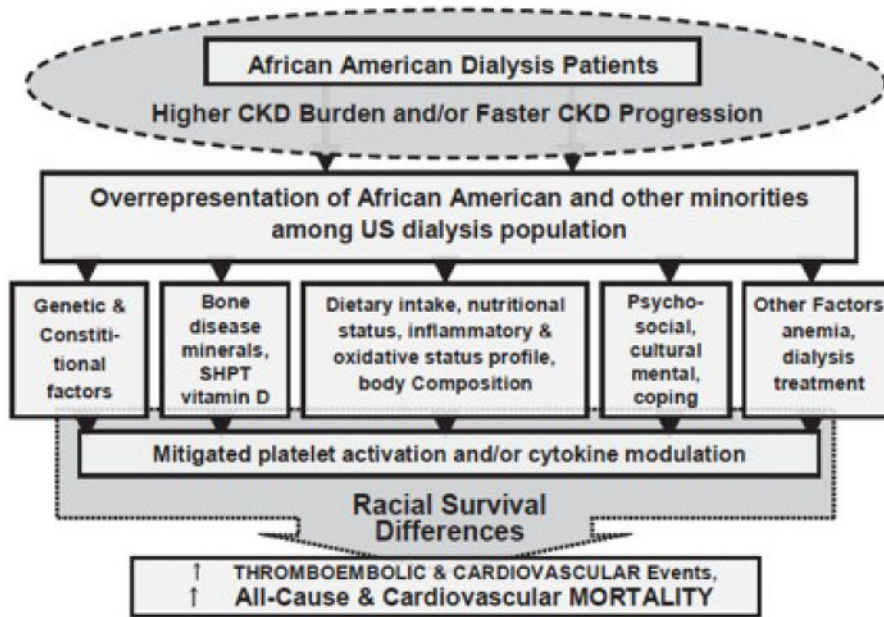


Figure 1. Potential mechanisms leading to the survival paradox of African American dialysis patients