

Racial disparity in mortality, by identified CKD stages in elderly Medicare patients

Suying Li, PhD, Jiannong Liu, PhD, David T. Gilbertson, PhD, Robert N. Foley, MD, and Allan J. Collins, MD
United States Renal Data System, Minneapolis Medical Research Foundation, University of Minnesota Twin Cities

Introduction

- The United States Renal Data System has shown that mortality rates for African Americans (AAs) are lower than those for Whites in dialysis patients.
- A study using the Third National Health and Nutrition Examination Survey data showed that in patients with early CKD stages (1-5) AAs had significantly higher risk for death than Whites among persons who were <65 yrs old, but this was not seen among those who were age 65 or older.
- Beginning October 2005, new ICD-9 codes were introduced to identify CKD by stage in the Medicare population.

Objective

- This study was to examine the mortality differences between Whites and AAs Medicare patients older than 65 years in different CKD stages.

Methods

- Study population included 2006 to 2007 period prevalent CKD patients from the 5% Medicare random sample age older than 65. Patients were excluded if they were enrolled in an HMO, Medicare as secondary payor, or diagnosed with ESRD.
- Patients were followed from January 1 to December 31, 2007 for 2006 CKD and from January 1 to December 31, 2008 for 2007 CKD; censored at ESRD date or the end of Medicare entitlement.
- CKD stage definitions were identified from 2006-2007 claims with ICD-9 codes of 585.1-5.
- Adjusted mortality rates by CKD stages were based on Cox regression and adjusted for age, gender, and comorbidities with the all CKD cohort as reference.
- Relative risks (RRs) was determined from Cox regression. To examine the risk of death and its association with patient characteristics, we performed an unadjusted model, and models adjusted for age, gender, and further adjustments for comorbidity.

Results

- Among the study population, 57,125 Whites and AAs were defined as CKD stages 1-5.
 - Whites: 87.2%
 - AAs: 12.8%
 - CKD stages 1-2: 19.7%
 - CKD stages 3: 53.1%
 - CKD stages 4-5: 27.1%
- Among the 49,793 Whites: CKD stages 1-2, 19.5%; stage 3, 53.9%; and stages 4-5, 26.6%
- Among the 7,332 AAs: CKD stages 1-2, 21.1%; stage 3, 47.9; and stages 4-5, 31.0%

Table 1. Baseline characteristics by CKD stages and race

	CKD stages 1-2			CKD stages 3			CKD stages 4-5		
	Whites	AAs	p-value	Whites	AAs	p-value	Whites	AAs	p-value
N	9,728	1,546		26,845	3,510		13,220	2,276	
Age (yrs)	78.1	76.0	<.0001	78.4	76.4	<.0001	79.7	77.6	<.0001
Female,%	48.6	53.4	0.0004	48.5	56.8	<.0001	52.0	61.5	<.0001
CVD,%	73.0	65.8	<.0001	74.4	66.8	<.0001	79.5	74.6	<.0001
Diabetes,%	45.9	58.2	<.0001	47.3	59.2	<.0001	48.8	60.9	<.0001
Anemia,%	45.1	48.1	0.0303	51.4	58.2	<.0001	68.1	72.7	<.0001
COPD,%	25.7	20.6	<.0001	25.3	19.4	<.0001	27.6	21.8	<.0001
Cancer,%	16.2	16.2	0.9969	17.0	17.3	0.7124	17.0	15.5	0.0809
Hypertension,%	91.1	96.3	<.0001	92.9	97.9	<.0001	93.5	97.1	<.0001
GI bleeding,%	8.5	8.6	0.8409	7.8	8.9	0.0218	10.4	11.2	0.2488
Liver disease,%	2.0	1.7	0.3678	1.8	1.5	0.1814	2.3	2.4	0.7262

Table 2. Mortality outcomes by CKD stages and race

	CKD stages 1-2			CKD stages 3			CKD stages 4-5		
	Whites	AAs	p-value	Whites	AAs	p-value	Whites	AAs	p-value
Death	1,202	153		3,801	413		3,038	469	
Unadjusted mortality	134.9	111.5		157.7	133.8		288.1	276.2	
Adjusted mortality ^{^^}	143.6	137.6		165.2	167.0		248.3	274.7	
RR unadjusted (95% CI)	1.00	0.83	0.0325	1.00	0.86	0.0030	1.00	0.96	0.4203
RR adjust 1 (95% CI)	1.00	0.98	0.7794	1.00	0.97	0.5815	1.00	1.10	0.0705
RR adjust 2 (95% CI)	1.00	0.99	0.8988	1.00	0.98	0.6748	1.00	1.10	0.0599
RR adjust 3 (95% CI)	1.00	1.00	0.9628	1.00	0.99	0.8574	1.00	1.11	0.0434

^{^^} per 1,000 patient-years; adjusted for age, gender, and all comorbidities with the all CKD cohort as reference
Adjust 1: age, gender
Adjust 2: age, gender, COPD, Cancer, DM, GI, HTN, and Liver Disease
Adjust 3: age, gender, COPD, Cancer, DM, GI, HTN, Liver Disease, Anemia, and CVD

Conclusions

- In the Medicare 5% random sample of patients with identified CKD stages 1-3, AAs were less likely to die when not adjusted for patient characteristics. The survival benefit in AAs became insignificant with adjustment for age, gender, and comorbidities.
- In the Medicare 5% random sample of patients with identified CKD stages 4-5, AAs were less likely to die when not adjusted for patient characteristics but this was not statistically significant.
- With adjustment for more patient characteristics, AAs were more likely to die. When adjusted for age, gender, and comorbidities, we found that AAs had significantly higher risk of death.
- We conclude that the improved AA survival on dialysis may reflect a survival bias compared to Whites.