

Racial disparity in hospital admissions for vascular access infection among incident hemodialysis patients

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Introduction

- Hospital admissions remain high for vascular access (VA) infection in the first year of hemodialysis (HD).
- The use of catheters also remains high among incident patients during the early months of dialysis despite a decrease in catheter placements among prevalent patients in recent years.
- While mortality among incident HD patients has been lower among African Americans than whites, little is known about predictive factors behind the elevated first-year VA infectious admission rates.
- We analyzed predictors of hospital admissions for VA infection in the first year of HD.

Methods

- The study cohort included 105,313 U.S. incident HD patients in 2006 and 2007, age 20 and older, who survived the first 90 days of dialysis.
- Included Medicare patients had a Medical Evidence Form indicating VA type used on first outpatient dialysis: catheter only, AV fistula, AV graft, or catheter/maturing internal access.

- Admissions for VA infection were identified from Medicare inpatient claims with an ICD-9-CM principal diagnosis code of 996.62.
- Adjusted admission rates for VA infection were computed by race, age, and months from initiation, and adjusted for gender, primary diagnosis, and initial VA type.
- A model-based adjustment method was used with an interval Poisson model and incident dialysis patients, 2005, as the reference cohort.
- Predictors of admission for VA infection in the first year of HD were analyzed with Cox proportional hazards regression models:
 - Patients with a bridge hospitalization spanning day 90 were excluded (included N=100,409).
 - Patients were followed from day 90 after initiation until first admission for VA infection, censoring at death, loss to follow-up, payer change, three days prior to transplant, 12/31/08, or after one year.
 - An additional model included the interaction of age and race.

Results

- Among patients age 20-44, there were higher percentages of males (59.0%), African Americans (49.0%) and patients with a catheter only as an initial access type (66.1%) compared to the older age groups (Table 1).
- Among age and race groups, the highest percentage of patients with only a catheter as initial VA type was found among 20-44 year-old African Americans (67.9%; Fig. 1).
- Adjusted admissions for VA infection were highest among African Americans compared to whites and other races within each age and interval (Fig. 2).
- The highest admission rates for VA infection were among 20-44 year-old African Americans in months 3-<4 after initiation (440 admissions per 1,000 patient years; Fig. 2).
- African Americans had significantly higher adjusted risk of admission for VA infection than whites (HR=1.12; 95% CI 1.07-1.17) and other races had lower risk (HR=0.88; 0.79-0.97; Fig. 3).

Table 1

Patient characteristics by age; values are column percentages	Age		
	20-44 (N=10,749)	45-64 (N=33,955)	65+ (N=60,609)
Gender			
male	59.0	57.7	53.2
female	41.0	42.3	46.8
Race			
African American	49.0	38.5	22.3
other	5.8	5.2	4.0
Primary diagnosis			
diabetes	38.2	57.0	43.8
hypertension	25.5	22.7	35.2
glomerulonephritis	13.1	5.3	4.4
other	23.2	15.0	16.6
Incident year			
2006	50.6	50.4	51.2
2007	49.5	49.7	48.8
Initial VA type			
catheter only	66.1	60.5	59.5
catheter/maturing internal access	19.7	21.3	20.0
AV fistula	11.2	14.1	15.6
AV graft	3.0	4.2	5.0

Figure 2

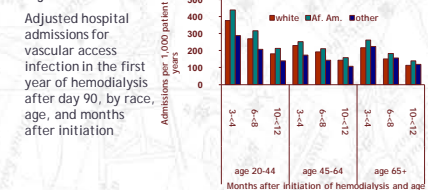


Figure 4

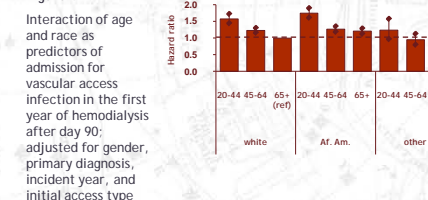


Figure 1

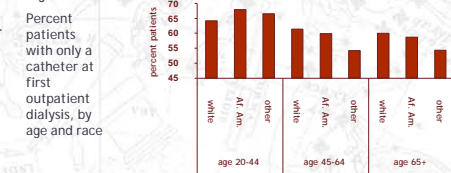
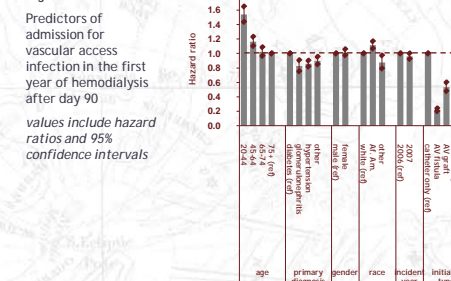


Figure 3



- Patients age 20-44 had significantly higher risk than age 75 and older (HR=1.54; 1.44-1.65; Fig. 3).
- Other factors associated with higher risk included diabetes as primary cause and catheter-only as initial VA type (AV fistula versus catheter only, HR=0.22; 0.20-0.24; Fig. 3).
- African Americans age 20-44 had significantly higher adjusted risk (P<0.05) than other age and race groups except whites age 20-44 (Fig. 4).

Conclusions

- Despite lower overall mortality rates, African Americans had high first-year admissions for VA infection, and catheter use may be a contributing factor.
- Vascular access infectious admission rates were especially high among younger (age 20-44) African Americans, and this association persisted even after adjustment for initial VA type.
- Results suggest further study of differential racial impact of infections on subsequent mortality.