

Comparative analysis of mortality, cancer, hip fracture, & infectious event rates in dialysis, CKD, transplant & general populations

Robert Foley MB, Tricia Roberts MS, Qiao Fan MS, David Gilbertson PhD, Allan Collins MD FACP
 United States Renal Data System, Minneapolis Medical Research Foundation, University of Minnesota Twin Cities

Introduction

- Understanding the comorbidity burden of the chronic kidney disease (CKD) and end-stage renal disease (ESRD) populations may provide insight into the high mortality rates among these groups.
- This study compared morbidity and mortality among ESRD, CKD, and non-CKD patients.

Methods

- The study cohort included Medicare dialysis, transplant, CKD, and non-CKD patients (N = 191,287, 22,673, 44,941, and 1,378,122, respectively) in the United States.
- Patients were prevalent on January 1, 2002, and followed for a maximum of two years, until December 31, 2003.

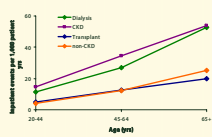
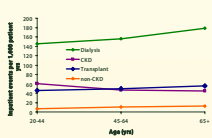
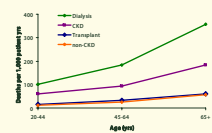
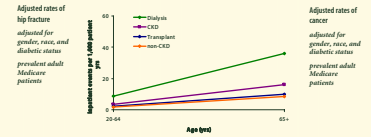
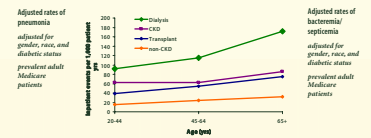
- The CKD and non-CKD cohorts were obtained from the 5% Medicare database.
- Diabetes and CKD status were defined during a one-year entry period in 2001.
- Events studied included pneumonia, bacteremia/septicemia, hip fracture, and cancer.
- Events were identified by the first inpatient ICD-9-CM diagnosis code for the disease during followup.
- For each cohort, mortality and event rates were calculated using the model-based adjustment method.
- Rates were presented by age and adjusted for gender, race, and diabetic status.
- The reference cohort consisted of all included patients.

Results

- Generally, mortality and event rates showed the following pattern:
 - dialysis > CKD > transplant > non-CKD.
- The increase in event rates with older age was steeper in dialysis patients than in the other three cohorts.
- With the exception of cancer, event rates for the youngest group of dialysis patients exceeded those of the oldest group of non-CKD patients.
- Compared to non-CKD, mortality rates were 6 to 9 times higher in dialysis patients and 3 to 5 times higher in the CKD cohort.
- For dialysis versus CKD, mortality rates were nearly twice as high; pneumonia, bacteremia/septicemia, and hip fracture rates were 2 to 4 times higher; and cancer rates were slightly lower.
- Among transplant patients, mortality, hip fracture, and cancer rates approached the lower rates of non-CKD patients, while infectious rates were closer to those of CKD patients.

Prevalent patient characteristics, 2002

	non-CKD (N=1,378,122)	CKD (N=44,941)	dialysis (N=191,287)	transplant (N=22,673)
Age (yrs)	20 to 44	4.2	1.7	11.4
	45 to 64	7.6	8.7	23.7
	65+	86.3	89.6	48.9
Gender	male	42.1	49.1	52.3
	female	57.9	50.9	47.6
Race	white	86.6	81.4	54.8
	black	8.9	13.4	39.3
	other	4.5	5.2	5.9
Diabetic status	diabetes	16.2	46.2	41.1
	non-diabetes	83.8	53.8	58.9



Conclusions

- The risk of serious medical conditions appears to be multiplied by the presence and severity of CKD.
- Recently revised ICD-9-CM diagnosis codes will allow future comparison of the comorbidity burden among the specific stages of CKD.
- The complexity of the dialysis population is demonstrated by extraordinarily high event rates.
- The distinctly and consistently poor outcomes of the dialysis cohort illustrate why it may be difficult to notably reduce all-cause mortality with a single intervention.