Comparative analysis of cardiovascular event rates in dialysis, CKD, transplant, and general populations

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Introduction

- Cardiac disease remains the leading cause of mortality in end-stage renal disease (ESRD) patients.
- This study describes the associations between cardiovascular events and the presence and severity of chronic kidney disease (CKD).
- We compared inpatient cardiovascular event rates in four patient cohorts: ESRD patients (dialysis and transplant) and non-ESRD Medicare patients (with and without CKD).

Methods

- We studied adult dialysis, transplant, chronic kidney disease (CKD), and non-CKD patients (N = 191,287, 22,673, 44,941, and 1,378,122, respectively) who were prevalent on January 1, 2002.
- The CKD and non-CKD cohorts were obtained from the 5% Medicare database, excluded patients with ESRD, with HMO coverage, or without continuous Medicare coverage, and.
- used diabetic and CKD status as defined during 2001.

- A limitation is that among CKD and non-CKD groups younger than age 65, only disabled or Railroad Retirement Board patients have Medicare coverage and therefore were included.
- Patients with a cause-specific hospitalization that spanned the start of followup were excluded.
- Patients were followed for up to two years, from January 1, 2002, to December 31, 2003.
- ESRD patients were censored at the earliest of death, loss to followup, end of status as Medicare as a primary payer, 12/31/03, transplant (dialysis patients only), or three years after transplant (transplant patients only).
- CKD and non-CKD patients were censored at the earliest of death, end of Medicare coverage, or 12/31/03.
- Events were identified by the first inpatient ICD-9-CM diagnosis code during followup.
- Events included acute myocardial infarction (AMI), congestive heart failure (CHF), stroke, and peripheral vascular disease (PVD).

Results

- Within each age group, event rate patterns showed:
  - non-CKD < transplant < CKD < dialysis.
  - Rates were strikingly higher in dialysis patients than in the other cohorts, and this disparity increased with older age.
- Rates of CHF, AMI, stroke, and PVD were 2 to 5 times higher in dialysis than CKD patients.
- In each of the four cohorts, CHF was the event with the highest rates.

Conclusions

- Both the presence and the severity of CKD appear to be risk multipliers for cardiovascular events.
- High cardiovascular event rates among dialysis patients, followed by CKD patients, support continuous efforts to reduce the cardiovascular disease burdens of these groups.
- These results may help to explain the challenge of achieving lower all-cause mortality with a single intervention.