

Trends In Sudden Cardiac Death as a Proportion of Total Cardiovascular Mortality in Prevalent Hemodialysis Patients

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Introduction

- ◆ Patients receiving maintenance hemodialysis (HD) have high rates of death due to cardiovascular (CV) causes.
- ◆ CV-related death can be divided into:
 - ◆ sudden cardiac death (SCD), and
 - ◆ other CV death
- ◆ SCD is often attributable to lethal arrhythmias.
- ◆ How hospital admissions for arrhythmias may have changed over time in HD patients has not been well explored.
- ◆ Further, how SCD has changed as a proportion of total CV death has not been fully described.

Methods

- ◆ Using CMS ESRD data from 1996-2013, we created yearly cohorts comprising HD patients who were covered by Medicare Part A on January 1 of that year.
- ◆ Prevalent patients were followed from January 1 to the earliest of death, transplant, loss of Medicare coverage, or year's end.
- ◆ We determined hospitalizations for arrhythmias (atrial, ventricular, and asystolic events).
- ◆ We calculated death rates per 100 patient-years for all-cause CV death and death due to SCD.
- ◆ Cause of death was ascertained from the ESRD Death Notification (form CMS-2746).

Results

Arrhythmia Hospitalizations

- ◆ Using primary diagnosis codes only, admissions for arrhythmias were virtually unchanged between 2004 and 2013, at approximately 4.5 admissions per 100 patient-years
- ◆ When using primary *or* leading secondary diagnosis codes, rates have remained virtually unchanged since 2008, at about 5.0 per 100 patient-years

CV Death

- ◆ All-cause CV death decreased from roughly 12 to 7 per 100 patient-years between 1996 and 2013.
- ◆ However, after modest decline from 2004 to 2010, SCD deaths have remained stable at approximately 5 per 100 patient-years.
- ◆ In 2009, 65% of all CV deaths were attributed to SCD; by 2013, the rate increased to 73%, a relative increase of about 12% in only 4 years.

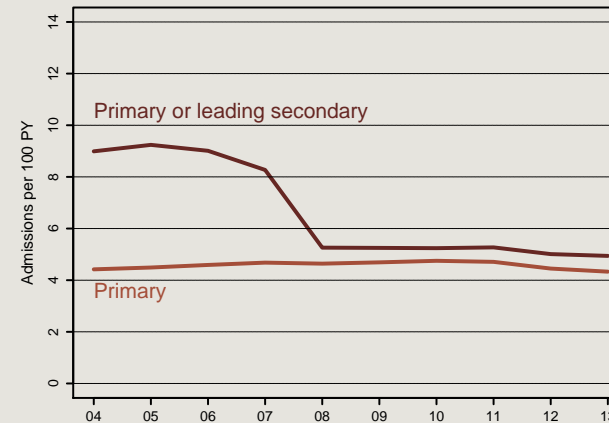


Figure 1. Admission rates, per 100 patient-years, for arrhythmias in prevalent HD patients, 2004-2013

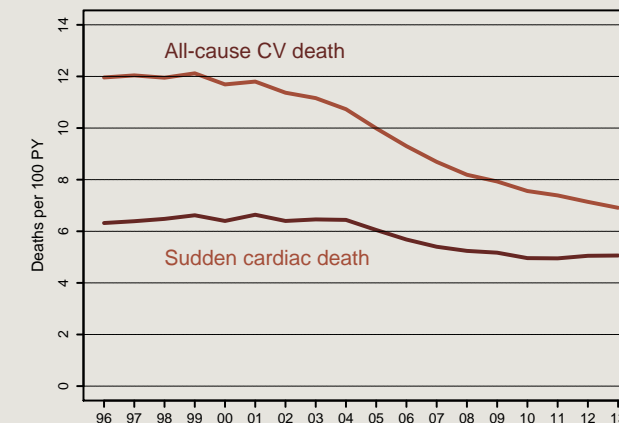


Figure 2. Death rates, per 100 patient-years, from all-cause CV death and sudden cardiac death in prevalent HD patients, 1996-2013

Conclusions

- ◆ Hospitalizations for admissions for arrhythmias have not changed measurably since 2004.
- ◆ Reduction in deaths due to SCD have lagged woefully behind reduction in all-cause CV death in HD patients.
- ◆ Issues such as the timing of events across the dialytic week (i.e., whether CV deaths and arrhythmia-related admissions occur on HD or on post-HD days, or before or after a dialysis treatment session) should be studied.
- ◆ Other issues, such as the effect of constituent electrolytes of the dialysis bath and the implications of the dialyzability of drugs such as β -blockers (which might prevent arrhythmia-related deaths), should be also be investigated.
- ◆ Future improvements in the overall CV death rate will require advances in preventing SCD.

