Lower Risk of Early Death in Incident Dialysis Patients on Daily Home versus In-center Hemodialysis

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Introduction
- Most patients newly diagnosed with end-stage renal disease (ESRD) initiate thrice-weekly in-center hemodialysis.
- However, despite recent decreases in mortality rates, clinical outcomes in the first year of dialysis are relatively poor.
- According to the United States Renal Data System, one-year survival among new dialysis patients in 2011 was 78.6%.
- According to the Peer Report, rates of death due to withdrawal from dialysis are especially high during the first 4 months.

Methods
- Data were ascertained from the United States Renal Data System (USRDS) database and linked records from NxStage Medical, Inc. (Lawrence, Massachusetts).
- DHHD patients initiated use of the NxStage System One between January 1, 2007, and June 30, 2010, and within 3 months of ESRD diagnosis.
- Matched IHD patients were selected from the USRDS database at a ratio of 5 to 1 and according to the propensity score (PS) of DHHD initiation.
- The PS included demographic factors, comorbidity factors, and biochemistry ascertained from the CMS ESRD Medical Evidence Report (form CMS-2728).
- We employed the intention-to-treat principle: we followed patients from the DHHD initiation date or the matched index date (in IHD patients) until the earlier of death or the conclusion of 1 year.
- Cause of death was ascertained from the ESRD Death Notification (form CMS-2746).
- Relative hazards of death for DHHD versus matched IHD patients were estimated from Cox proportional hazards regression, with stratification by matched cluster.

Results
- We identified 834 DHHD patients and 4170 matched IHD patients.
- There were 79 deaths (9.5%) in DHHD patients and 512 deaths (12.3%) in matched IHD patients.
- Among deaths in DHHD patients, counts by cause of death were:
  - Cardiovascular disease, N = 36
  - Infection, N = 10
  - Cachexia or dialysis withdrawal, N ≤ 10
  - Malignancy, N = 10
- We assessed the relative risk of early death in DHHD versus matched in-center hemodialysis (IHD) patients.

Conclusions
- DHHD was associated with significantly lower risk of early death than IHD.
- The mortality risk difference was primarily attributable to survival advantages for DHHD patients in two causes of death:
  - Cardiovascular death
  - Unknown causes of death
- The association of DHHD with lower risk of death was independent of unmeasured cardiovascular complications, such as higher New York Heart Association functional class. Thus, some results in this study may be biased against DHHD.
- Further assessments of DHHD in incident dialysis patients are critically needed.