Introduction

- Hyperkalemia is a common and important disorder in hemodialysis (HD) patients.
- Hyperkalemia is associated with increased risk of arrhythmias and sudden cardiac death. 1
- Few studies 1 have examined its occurrence in a large population of HD patients.
- We investigated hyperkalemia prevalence and its association with interdialytic interval.

Methods

DATA AND STUDY COHORT

- Annual cohorts of HD patients 2007-2010 were created using the linked DaVita®/USRDS database.
- Inclusion criteria:
  1. Prevalent HD patient, age ≥ 18 years, on a thrice-weekly schedule.
  2. Alive and continuously enrolled in fee-for-service Medicare Parts A and B with no participation in an HMO from July 1 of the prior year through January 31 of the cohort year.
  3. Received ≥ 6 dialysis sessions in December of the prior year.
  4. No missing potassium (K) dialysate bath records for dialytic treatments in December of the prior year.
  5. Serum K records in January of the cohort year.

STUDY MEASURES

- On a monthly basis, hyperkalemia was defined as a serum K concentration ≥ 5.5 mEq/L.
- Hyperkalemia prevalence was calculated as the cumulative number of monthly episodes divided by cumulative follow-up time.
- Hyperkalemia prevalence was also reported separately by long and short interdialytic interval.
  1. HD schedule was defined as Monday-Wednesday-Friday (MWF) or Tuesday-Thursday-Saturday (TTSS).
  2. The day after the 2-day interval between sessions (“long interdialytic interval”) was defined as M for patients on an MWF schedule and as T for patients on a TTSS schedule.
  3. Thus, for patients on an MWF schedule, hyperkalemia episodes occurring on A were attributed to a long interdialytic interval; T was treated analogously.

Results

- 28,769 patients were included in 2007 and 36,879 in 2010 (Table 1).
- The mean age was approximately 63 years; slightly more than half of patients were white and approximately 56% were men.
- Hyperkalemia prevalence was consistent at 16.3-16.8 events per 100 patient-months (Table 2).
- For hyperkalemia episodes on the day after the long interdialytic interval, prevalence was 58.7-62.9 per 100 patient-months (Table 3).
- In contrast, for hyperkalemia episodes on the day after the short interdialytic interval, prevalence was 26.6-28.8 per 100 patient-months.
- Hyperkalemia was 2.0-2.4 times more likely on the day after the long dialytic interval than on the day after the short interval.

Conclusions

- Hyperkalemia is highly prevalent among maintenance HD patients.
- Hyperkalemia rates are more than twice as high on the day after the long interdialytic interval than on the day after the short interval.
- This phenomenon may be partly responsible for the reported increased rates of adverse events during the long interdialytic interval. 3,4
- Further studies of this important issue are clearly warranted to investigate how the timing of dialysis influences hyperkalemia and, as a result, mortality in HD patients.

References

2. Mount DB et al, 2004
3. Foley R et al, 2011
4. USRDS ADR 2012; Vol 2, Ch 3. Fig 11-13.