

Recurrent Acute Kidney Injury: Prevalence and Outcome

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Introduction

- In patients with acute kidney injury (AKI), the risk of AKI recurrence and its long-term implications in terms of ESRD and mortality has not been studied in a large patient population. In this study, we aimed to determine the risk of recurrences of acute kidney injury and the subsequent risk of ESRD and mortality in that patient population with recurrences.
- We utilized the 2009 Medicare 5% cohort to identify elderly patients with an AKI in 2009, and followed them forward for up to 1 year to look for recurrence as well as outcomes of death and ESRD. Our primary objectives were to determine the post discharge incidence of recurrent AKI and the hazard of ratio of death or developing ESRD.

Methods

- Using the 2009 Medicare 5% cohort, we identified 43,814 patients aged 65+ as of January 1, 2009 with an AKI event (a diagnosis code of 584.x in any position during an inpatient stay) during 2009. Demographic information was obtained from the 5% denominator file. Diagnosis codes on the claim for the AKI inpatient stay were used to identify co-morbid conditions as well as CKD stages, Procedure codes, HCPCS, and CPTs on the claim for the inpatient stay (or Part B claims occurring during the stay) were searched to identify patients who received dialysis during their AKI hospitalization. Patients who died or became classified as ESRD before discharge were identified and excluded from the follow-up events.
- Follow-up events (recurrent AKI, development of ESRD, and death) were identified for each patient who was discharged alive from the initial AKI hospitalization. The ESRD event was censored by a recurrent AKI, and death was censored by either a recurrent AKI or the development of ESRD.

Results

- Of the 43,814 identified, 38,323 represented our study cohort after excluding patient who died, had ESRD and lost Medicare eligibility after AKI event (Tab. 1).
- Recurrent AKI occurred in almost 30% of patients, and at a higher rate within those who required dialysis during the initial AKI (66.2 per 100 patient years, vs. 48.4 for all AKI patients; Fig. 1).
- Of the 11,155 patients with a recurrent AKI, ESRD was higher (0.3%), especially those needing dialysis was higher(5%) than initial AKI events(2.2%). (Fig. 2). Similarly, Mortality rates overall and within those requiring dialysis are 40% to 60% higher after a recurrent AKI than after the initial AKI (Fig. 3).

Table 1. Estimated Hazard Ratios for select events after live discharge of AKI and recurrent AKI

	Initial AKI Event Admitted: 43,814 Died during: 4991 ESRD during: 481 Discharged: 38,323 (944 w/ dialysis) All patients		Recurrent AKI Event Admitted: 11,155 Died during: 1157 ESRD during: 200 Discharged: 9,719 (280 w/dialysis) All patients		
ESRD prior to another AKI	N (%)	68 (0.2%)	21 (2.2%)	34 (0.3%)	14 (5.0%)
Rate per 100 patient years		0.295	5.584	0.821	19.543
Death prior to ESRD or another AKI	N (%)	8750 (22.8%)	309 (32.7%)	2479 (25.5%)	84 (30.0%)
Rate per 100 patient years		37.969	82.169	59.855	117.255
Admitted for a recurrent AKI	N (%)	11155 (29.1%)	249 (26.4%)		
Rate per 100 patient years		48.405	66.214		

Figure 1. Cumulative Probability of Recurrent AKI

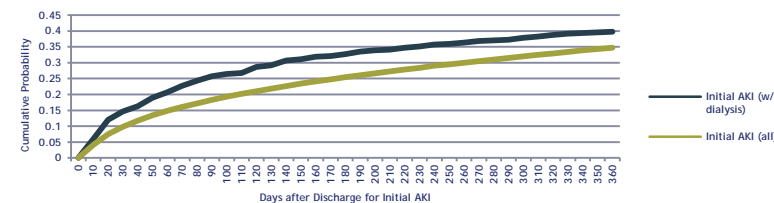


Figure 2. Cumulative Probability of ESRD

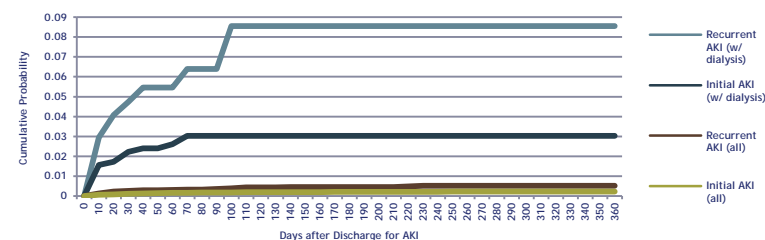
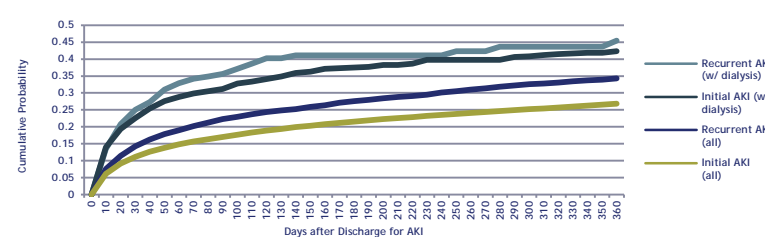


Figure 3. Cumulative Probability of Death



Conclusions

- In summary, there was a significant risk of recurrence of acute kidney injury and was associated with worse outcome in terms of ESRD and mortality in a one-year period in those who survived an AKI event.