

Characteristics of Patients with Acute Kidney Injury: Community-Acquired compared to Hospital-Acquired AKI

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Background

- Inpatient AKI is common and associated with poor short and long-term outcomes.
- AKI present *before* hospitalization is increasingly being recognized, but has not been well characterized.

Objectives

- To compare characteristics of individuals whose serum creatinine (sCr) improved after admission to an urban academic medical center

Methods

- We obtained discharge and inpatient serum Creatinine (sCr) data for fiscal years 2010-2013 from UAB medical center.
 - We included all inpatients ≥ 18 years old who had ≥ 3 inpatient sCr measurements and were admitted for ≥ 1 day.
 - We excluded patients with a history of ESRD, kidney transplant, minimum sCr < 0.4 , or baseline GFR < 5 mL/min/1.73m².
 - We included individuals with inpatient AKI as defined by an absolute increase ≥ 0.3 mg/dl from the lowest of the first three sCr or receiving inpatient dialysis.
 - We defined resolving, community-acquired AKI as a sCr decrease ≥ 0.3 mg/dl from the first inpatient sCr.
 - We limited analysis to the first 22 days of hospitalization or 60 sCr measurements.
 - We compared patient characteristics, AKI incidence and inpatient mortality rates for those with Community-Acquired and Hospital-Acquired vs No AKI.
 - We defined chronic kidney disease (CKD) as estimated glomerular filtration rate (eGFR) < 60 mL/min/1.73m² as calculated from first hospital sCr.

Community-Acquired vs Hospital-Acquired AKI

Characteristic	NO-AKI	CA-AKI	HA-AKI
Number (%) [†]	38,735 (55) [†]	17,131 (25) [†]	13,960 (20) [†]
Age—yr, median (25 th -75 th -centile)	55 (42-67)	58 (45-70)	59 (48-70)
Male sex—no. (%)	19,368 (50)	9,810 (57)	7,273 (52)
Black race—no. (%) [‡]	12,780 (33)	6,624 (39)	5,697 (41)
Length of stay—days, median	4 (2-6)	5 (3-8)	7 (4-11)
Any ICU Day—no. (%)	6,791 (18)	4,977 (29)	5,439 (39)
Initial serum creatinine	0.94 \pm 0.4	1.8 \pm 1.2	1.6 \pm 1.5
Peak serum creatinine	1.0 \pm 0.4	1.8 \pm 1.2	2.3 \pm 1.8
Initial eGFR	91 \pm 28	53 \pm 27	67 \pm 35
Initial eGFR < 60 —no. (%) [§]	5,966 (15)	10,469 (61)	6,169 (44)
Inpatient Dialysis—no. (%)	N/A	N/A	915 (6.6)
Inpatient Death—no. (%)	377 (1.0)	356 (2.1)	1,308 (9.4)

P < 0.01 for all comparisons

*Means are shown ± 1 SD. Medians are shown with 25th-75th centiles. Percentages may not total 100 because of rounding. To convert the values for creatinine to micromoles per liter, multiply by 88.4. AKI denotes acute kidney injury; CA-AKI, community-acquired AKI; eGFR, estimate glomerular filtration rate; HA-AKI, hospital-acquired AKI; ICU, intensive care unit. By *a priori* definition, any individual receiving inpatient dialysis was classified as HA-AKI. Excludes individuals with a prior history of kidney transplant or end-stage renal disease; individuals with < 3 serum creatinine measurements during hospitalization, and individuals with length of stay < 1 day.

[†]Percentages are row percentages; all others are column percentages.

[‡]Race or ethnic group was self-reported, and further classified as black or non-black.

[§]eGFR based on initial serum creatinine

Results

- Compared to those without evidence of AKI, individuals with AKI present *before* hospital admission:
 - were older (58 vs 55)
 - had longer length of hospital stay (5 days vs 4 days)
 - had higher baseline sCr (1.8 vs 0.94)
 - had higher peak sCr (1.8 mg/dl vs 1.0 mg/dl)
 - were more likely to be male (57% vs 50%)
 - were more likely to be of Black race (39% vs 33%)
 - were more likely to have chronic kidney disease (61% vs 15%)
 - were more likely to spend time in an ICU (29% vs 18%)
- Compared to both No AKI and CA-AKI, those with HA-AKI were older, more likely to be of Black race, had longer length of hospital stay and were more likely to spend time in an ICU, had higher peak sCr.
- 21-day inpatient mortality was greater among those with AKI present before admission compared to those without AKI (2.7% vs 1.0%), but much less than those who developed AKI after hospital admission (9.4%).

Conclusions

- CA-AKI and HA-AKI are associated with increased length of hospital stay, ICU admission, and inpatient mortality.
- CA-AKI, which resolves during hospitalization without dialysis, has different patient demographics and reduced inpatient mortality compared to HA-AKI.
- CKD appears to be a greater risk factor for CA-AKI than HA-AKI.
- These results show the burden of AKI at one large medical center and highlight the importance of characterizing populations at risk to better define opportunities for prevention, timely diagnosis, and treatment of AKI.

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