

Association Between Acute Kidney Injury Duration and Outcomes in Critically Ill Children

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OBJECTIVES: Acute kidney injury occurs frequently in children during critical illness and is associated with increased morbidity, mortality, and health resource utilization. We aimed to examine the association between acute kidney injury duration and these outcomes.

DESIGN: Retrospective cohort study of all children admitted to PICUs in Alberta, Canada between January 1, 2015, and December 31, 2015.

MEASUREMENTS AND MAIN RESULTS: In total, 1,017 children were included, and 308 (30.3%) developed acute kidney injury during PICU stay. Acute kidney injury was categorized based on duration to *transient* (48 hr or less) or *persistent* (more than 48 hr).

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet



Acute Kidney Injury > 48 hours in PICU is bad

Results:

- Transient acute kidney injury occurred in 240 children (77.9%), whereas 68 children (22.1%) had persistent acute kidney injury.
- Persistent acute kidney injury occurred more frequently in those with higher illness severity and in those admitted with shock, sepsis, or with a history of transplant and was more likely to start within 24 hours from PICU admission.
- Mortality varied significantly according to acute kidney injury status: 1.8% of children with no acute kidney injury, 5.4% with transient acute kidney injury, and 17.6% with persistent acute kidney injury died during hospital stay ($p < 0.001$).
- On multivariable analysis adjusting for illness and acute kidney injury severity, transient and persistent acute kidney injury were both associated with fewer VFD at 28 days (−1.28 d; 95% CI, −2.29 to −0.26 and −4.85 d; 95% CI, −6.82 to −2.88), vasoactive support-free days (−1.07 d; 95% CI, −2.00 to −0.15 and −4.24 d; 95% CI, −6.03 to −2.45), and hospital-free days (−1.93 d; 95% CI, −3.36 to −0.49 and −5.25 d; 95% CI, −8.03 to −2.47), respectively.

Conclusion: In critically ill children, persistent and transient acute kidney injury have different clinical characteristics and association with outcomes. Acute kidney injury, even when its duration is short, carries significant association with worse outcomes. This risk increases further if acute kidney injury persists longer independent of the degree of its severity.

Key message: Longer duration of AKI is associated with unfavorable outcome.

EXPERT COMMENT

“The current KDIGO definition characterizes AKI based on serum creatinine and urine output. This study clearly demonstrates ‘duration of AKI’ as an important component with persistent AKI (>48 h) needing additional interventions and is associated with unfavorable outcomes. Addition of duration of AKI as an important dimension may refine the definition of AKI and identify higher risk AKI subpopulations for enhanced monitoring, targeted interventions, and follow-up.”

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With warm regards,

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Reference

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