

# Acute Kidney Injury in Pediatric Critical Care Unit Patients: Nephrology Involvement and Follow Up

Chloe Butler, MD<sup>1</sup>; Julia Steinke, MD, MS<sup>2</sup>; Dawn Eding, RN, BSN, CCRN<sup>3</sup>; Douglas DeGraaf, RN, BSN<sup>3</sup>; Mary Awendt, MD<sup>4</sup>; Nwanzu Ndika MBBS, MPH<sup>3</sup>; Natalie Hautala, RN, BSN<sup>3</sup>; Richard Hackbarth, MD<sup>2</sup>

1. GRMEP/MSU Pediatric Residency, Grand Rapids, MI 2. Helen DeVos Children's Hospital, Grand Rapids, MI 3. Spectrum Health, Grand Rapids, MI 4. Cincinnati Children's Hospital, Cincinnati, OH

## Background

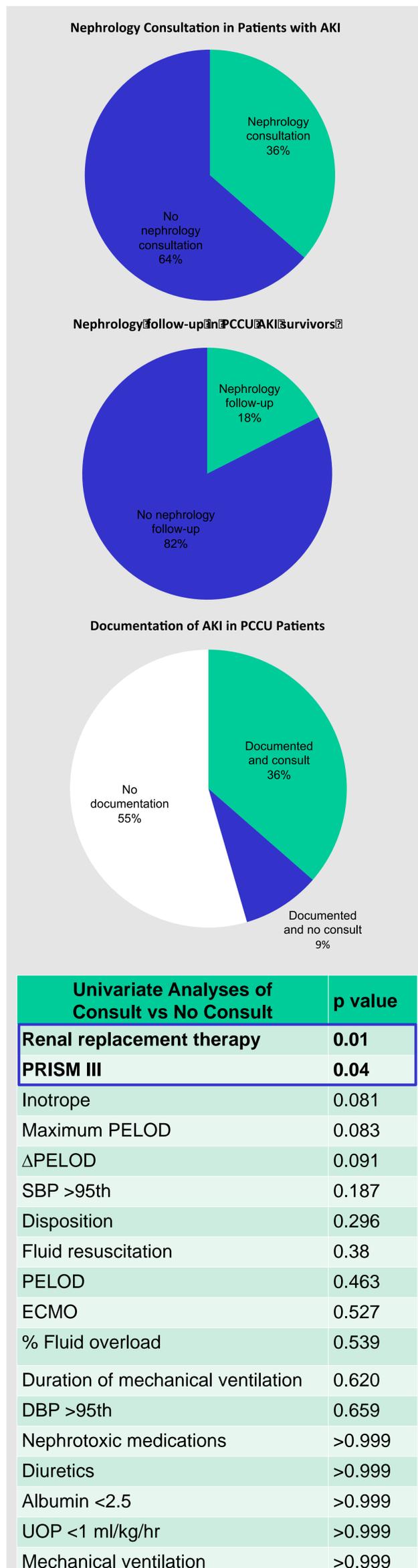
- There is a recognized worldwide increase in the incidence of acute kidney injury (AKI) and chronic kidney disease (CKD).
- The cause of CKD is shifting from primary kidney disease to a secondary outcome of patient illness and treatment.
- AKI is a known complication in pediatric critical care unit (PCCU) patients, occurring in 20-40% of all patients admitted to the PCCU.
- CKD is a known complication of AKI, found in at least 10% of patients, although some studies suggest a higher incidence.

## Study Aim

- We hypothesize nephrology consultation and outpatient follow up is less than would be expected for the observed incidence of AKI in PCCU patients. We postulate that this is likely due to under recognition of patients meeting AKI criteria.
- Secondary aim:
  - To assess the risk factors for AKI with regards to whether or not the patient received a nephrology consultation.

## Methods

- With IRB approval, patient data were collected under the protocol of a large, multi-institutional study: Assessment of Worldwide AKI, Renal angina and Epidemiology (AWARE).
- Our study evaluates only the single center cohort of data collected at Helen DeVos Children's Hospital (HDVCH).
- All patients admitted to the PCCU during a 3 month collection period were screened with the following inclusion criteria:
  - Age greater than 3 months
  - PCCU stay greater than 48 hours
  - No known pre-existing kidney disease
  - Admission not for the purpose of congenital heart disease repair or not within 3 months of previous repair
- The study group was further defined as having AKI if a baseline creatinine value was available for KDIGO scoring and the KDIGO score was greater than 1.
- This group underwent retrospective chart review to identify:
  - Nephrology consultation
  - Outpatient nephrology follow-up
  - Documentation of AKI



## Statistical Analysis

- Data regarding known risk factors for AKI were extracted from the AWARE database and analyzed using the Mann-Whitney and Fisher's Exact test between patients who received a consult and those that did not.
- The sample size of discharged patients was too small for statistical analysis.

## Results

- Of 360 screened patients, 270 met inclusion criteria with 53 having a creatinine available for KDIGO scoring.
- Twenty-two patients were found to have a KDIGO >1, which was used to define AKI.
- Eight of 22 patients, 36.4%, received a nephrology consultation.
- Three of 17 survivors, 17.6%, had outpatient nephrology follow-up documented on their discharge paperwork.
- Five patients expired during the study, four of whom had received nephrology consultation.
- Patients who received a nephrology consult had a higher rate of renal replacement therapy and a higher median PRISM III score compared to those who didn't undergo consultation (p<0.05).
- Ten patients, 45.4%, had AKI documented on a progress note, discharge summary or problem list.
- Of those with documented AKI, 8 of 10 (80%) had a nephrology consultation. Nephrology was not consulted on any patient for whom AKI was not documented.

## Conclusions

- Many PCCU patients with AKI are not evaluated by a nephrologist during their hospitalization. Even fewer of these patients have long-term follow up scheduled at time of hospital discharge.
- Lack of consultation is due primarily to lack of recognition of patients meeting KDIGO criteria for AKI.
- Nephrology consultation in PCCU patients with AKI is highly variable and many risk factors for AKI are not associated with nephrology consultation.
- There may be a need for programmed decision support within electronic medical records to alert providers of patients meeting AKI criteria.
- Education of providers on the potential long-term consequences of AKI is warranted.

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