Critical Care Nephrology: It’s Not Just Acute Kidney Injury

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The care of the critically ill with kidney disease represents a growing proportion of patients treated by nephrologists in the hospital. As a result, critical care nephrology, melding together the expertise of nephrologists and intensivists, has emerged as a distinct subspecialty during the past decade.1–3 Critical care nephrology is a topic at national and international meetings, has a proposed core curriculum for trainees,4 and even has its own textbook5; however, a casual perusal of the literature in critical care nephrology rapidly reveals an almost exclusive focus on issues pertaining to acute kidney injury (AKI) with relative neglect of the patient with ESRD and superimposed critical illness. In a nearly 1800-page textbook of critical care nephrology, discussion of critically ill patients with ESRD are covered in fewer than a dozen pages.6

The need for critical care nephrology to broaden its perspective and provide increased focus on patients who have ESRD and are critically ill is highlighted by the findings of Strijack et al., in this issue of JASN.6 Using a prospectively maintained database of all adult patients admitted to intensive care units (ICUs) in Winnipeg, Manitoba, Canada, they found patients with ESRD accounted for nearly 3.4% of all ICU admissions and estimated the annual rate of ICU admission among adult patients with ESRD was more than 25 times that of the general adult population. The ESRD patients were younger, less likely to be male, and more than twice as likely to have diabetes as compared with the general ICU population. Although rates of coronary artery disease were similar, patients with ESRD had more than two-fold the rate of peripheral vascular disease, were more likely to require ICU care for nonsurgical disease, had more than double the rate of sepsis than the general ICU population, and had substantially higher severity of illness scores, even after subtracting the renal component. The patients with ESRD composed nearly 40% of patients who received renal replacement therapy (RRT). The remainder, representing patients with AKI, had even higher severity of illness scores with more than double the frequency of sepsis as compared with the patients with ESRD. Overall hospital mortality was approximately 10% in critically ill patients without ESRD or AKI, 16% in the patients with ESRD, and more than 40% in the patients with AKI. In contrast to patients with AKI, ESRD status was not independently associated with mortality risk, and ICU length of stay and resource use were similar to those of the overall ICU population. ICU readmission rates, however, were approximately twice as high in both the patients with ESRD and the patients with AKI as in the general ICU population.

This study confirms and extends the findings of previous studies evaluating ICU use and outcomes in patients with ESRD.7–11 The majority of past studies were small, single-center analyses with limited inference to generalize. The only previous analysis of a large regional data set used the Intensive Care National Audit and Research Centre (ICNARC) Case Mix Programme database from Great Britain.11 This analysis found patients with ESRD composed 1.3% of all 276,731 admissions to 170 adult ICUs in England, Wales, and Northern Ireland between 1995 and 2004. On the basis of the period prevalence of ESRD, the ICU use rate was approximately six admissions per 100 ESRD patient-years, a rate slightly less than half that observed by Strijack et al.6 A variety of reasons may account for this, including differences in case mix, criteria for ICU admission, and other ICU practice patterns as reflected by differences in age, frequency of nonsurgical ICU admissions, and ICU and hospital mortality rates in both general ICU and critically ill patients with ESRD. Although ESRD status was associated with an increased odds of inhospital death (1.82; 95% confidence interval 1.13 to 1.37) in the ICNARC data set, after adjustment for demographics and case-mix factors, the odds of death (1.24; 95% confidence interval 1.69 to 1.96) were markedly attenuated, suggesting that underlying comorbidity rather than renal failure per se was the major determinant of increased mortality risk in patients with ESRD.

These data emphasize the need to include patients with ESRD in the spectrum of critical care nephrology. Patients with ESRD develop critical illness more frequently than the general population and have a greater severity of illness than those without renal disease. Moreover, patients with ESRD often present a unique set of clinical issues related to fluid and electrolyte management, mineral homeostasis, bleeding diatheses, and drug dosing that require the multidisciplinary expertise of nephrologists and critical care providers. Al-
though renal failure seems to be, at most, only a minor contributor to the increased mortality risk associated with critical illness in patients with ESRD, the simple fact remains: Mortality in patients who have ESRD and develop critical illness is unacceptably high. To improve the care and outcomes of critically ill patients with ESRD, practitioners and investigators need to broaden the focus of critical care nephrology to include this patient population.

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**DISCLOSURES**

None.

**REFERENCES**


See related article, “Outcomes of Chronic Dialysis Patients Admitted to the Intensive Care Unit,” on pages 0000–0000.