Guiding Physician Decisions for Initiating Dialysis for AKI: Is Progress on the Horizon?

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Timing of RRT initiation for AKI varies widely in clinical practice, particularly when the classic indications—hyperkalemia, fluid overload, and refractory acidosis—are not present. There is no unique parameter to accurately distinguish a patient with AKI who will need RRT support from those who will recover without RRT. The clinician most often balances patient-related factors, including levels and trajectories of creatinine and urea, the severity of complications related to kidney dysfunction, fluid accumulation, and oliguria, with the risks for adverse consequences associated with the procedure, including hypotension, bleeding, and catheter-related complications. A decision to start early RRT in a patient with the possibility of spontaneous recovery of renal function could impose unnecessary adverse effects and possibly, contribute to mortality (1–6). However, the standard strategy of watchful waiting, which involves waiting for a conventional indication or recovery, can result in the occurrence of preventable complications and death (7–9).

In the context of recent contradictory results of trials evaluating the effect of timing of dialytic intervention (7,10), Mendu et al. (11) used a distinctive pragmatic approach to the problem. They implemented a Standardized Clinical Assessment and Management Plan (SCAMP) as a quality improvement project in an academic medical intensive care unit. During a 3-month period, they applied a decision-making algorithm to optimize RRT initiation and discontinuation. The AKI SCAMP algorithm provided recommendations to assist clinicians in deciding when to initiate or withhold dialysis on the basis of patient comorbidities and clinical parameters. Because timing of RRT initiation is uniformly acknowledged to lack clear guidelines, the implementation of a standardized care would help define goals and potentially, optimize outcomes. As such, the study was granted a waiver of informed consent by the Institutional Review Board. With this approach, the study eliminated a challenge faced by randomized trials aiming to evaluate timing of RRT initiation, patient recruitment, and enrollment. Over a 3-month period, they followed 176 patients with AKI who had a nephrology consultation and were managed by nine nephrologists in a medical intensive care unit. Although the nephrologists had the choice of whether to follow the recommendation of the algorithm, they were still able to capture reasons for protocol deviation in 612 decision-making forms of 162 patients with complete information.

In most patients (116 [66%]), recommendations were consistently followed, and in 60 patients (34%), at least one recommendation was not followed. Not surprisingly, in accordance with the watchful waiting strategy, almost all recommendations to wait (98%) were followed, whereas in 57% of the patients, clinicians did not follow the recommendation to start RRT. Although the main reason for deviating from the algorithm to start RRT was an expectation of renal recovery (48%), one third of the patients ultimately required dialysis, and 50% died. These results are consistent with the findings of the Artificial Kidney Initiation in Kidney Injury Randomized Trial of early versus delayed start that showed that RRT could be avoided in over 50% patients and that those who were eventually dialyzed had a higher mortality (10). The SCAMP study confirms the watchful waiting approach as the prevailing strategy for dialysis initiation in AKI. The higher mortality in those in the protocol deviation group compared with those patients whose clinicians adhered to all SCAMP recommendations and started RRT when recommended may signal that the watchful waiting approach could contribute to increased mortality.

Because the study was limited to patients who had a nephrology consultation, the timing of nephrologist involvement could be an additional factor influencing decisions and outcomes (12). In fact, physicians cited a perception of futility as a reason for not following recommendations for RRT initiation in 20% of the patients. In another 19% of patients, there was concern that RRT could hasten the demise or was not consistent with the goals of care or perceived to be of benefit by the treating team. This suggests that there may have been an inherent delay in applying the SCAMP parameters in these patients, because they may have been consulted when they were sicker and perceived to have a lower chance of survival (13).

As in a randomized, controlled trial, the inclusion of patients with lower chances of survival in the control arm, regardless of provision of RRT, increases the likelihood of a favorable effect of the intervention (2). In this observational study, the high rate of protocol deviation in patients in whom the therapy is perceived as futile favored a lower mortality rate in the group

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with adherence to the algorithm. This point shows the importance of accounting for physician futile perception and overall severity of illness in the decision-making process or RRT provision and initiation (14).

The importance of the overall severity of illness is re-emphasized in the results of the multivariable analyses. After adjusting for age, albumin, and disease severity at enrollment, adherence to the algorithm recommendations was associated with better survival only in those with lower predicted mortality (≤50%). In other words, in patients with higher degree of severity of illness, not following the recommendation was not associated with increased mortality. This reflects the complexity of the decision-making process and uncertainty to initiate RRT that prevails in patients with multiple organ dysfunction and higher disease severity.

Although the SCAMP data forms were comprehensive and included several aspects associated with the parameters to define RRT initiation, the weight of these variables and their interactions could not be captured and/or incorporated in the decision-making algorithm. These factors are routinely assessed and weighted by physicians deciding on timing of initiation. How these factors influence the physician’s decision to initiate RRT can vary widely from one physician to another and with the same physician on the basis of the same set of clinical variables across different patients. Although the study involved only nine nephrologists, the authors did not provide data on the extent that physicians were consistent in their decisions and the point in the course of illness that the SCAMP were recommendations provided. The lack of agreement between physician and algorithm may reflect the need for assessing and incorporating more quantitative parameters in the decision-making algorithm (15). Again, this emphasizes that the clinical decision to initiate or withhold RRT should be on the basis of a dynamic monitoring of interaction of kidney function and the demand imposed by overall illness rather than any set of absolute conditions (1,15–19). Ideally, renal support should start when a mismatch between kidney demand and capacity exists or is anticipated. However, the watchful waiting strategy may be appropriate when the mismatch is stable or decreasing. Within this concept, RRT initiation can be considered at lower stages of AKI if demand is high and may be withheld in more severe stages if the metabolic and fluid demands are low or decreasing. Nevertheless, acute RRT constitutes an integral component of multi-organ support for critically ill patients, and the decision to offer the support should not be made in isolation but in conjunction with other forms of organ-support therapies. This integration requires frequent reassessment, because the delay in offering support when fluid and/or metabolic demand exceed renal capacity may affect patient recovery and overall outcome.

The study by Mendu et al. (11) highlights the challenges of implementing a decision support system and raises the possibility of improving clinical care by providing clinicians a framework with specific recommendations for interventions. In the context of a single academic center, the authors recognize that the difference in mortality found in patients whose physicians followed the algorithm recommendation is most likely overemphasized. Nevertheless, the algorithm illustrates the opportunity to reduce practice variation across not only physicians but also, centers. The degree of discordance between physician and algorithm to start RRT may be lower in hospitals, where clinicians are already accustomed to relatively early RRT initiation. Clearly, there is a great need to continue research in this field. The rapid improvement in electronic medical record technologies facilitates real-time prompts and should allow the implementation of evidence-based algorithms to guide clinicians in decisions on RRT. Changing physician behavior will, however, require a consistent effort to show the value of timely intervention with RRT guided by dynamic patient-centered tools that are quantitative and reproducible across different settings. Although we have some distance to travel, the way ahead is becoming clearer.

Disclosures
None.

References

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See related article, “A Decision-Making Algorithm for Initiation and Discontinuation of RRT in Severe AKI,” on pages 228–236.