Acute Kidney Injury: Toward an Integrated Understanding through Development of a Research Agenda

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Acute kidney injury (AKI) is widely recognized as an important predictor of morbidity and mortality and as an antecedent to chronic kidney disease (1). In the past 5 yr, there has been increasing interest in understanding this entity, at the both basic science and clinical levels. Recent advances in methodology have led to the description of both serum and urine biomarkers and the imaging of events occurring at the cellular level (2–5). Advances in understanding of and technology associated with dialysis in acute care settings have also contributed to the increasing recognition and treatment of AKI in these settings and the development of research studies to define its appropriate use (6–9).

The purpose of this collection of articles is to describe the development of a research agenda, using a modified Delphi approach, that is based on a conceptual framework and a refined definition of AKI. Although each article is written in a different format, the key messages are similar: There is a limited evidence base about most aspects of AKI, and there is a need, through a concerted effort of clinicians and researchers, to address questions that will have an impact on patient outcomes. We acknowledge that AKI is a term that actually encompasses multiple etiologies. For the purposes of defining a research agenda, it is clear that an overarching term is preferred: Specific etiologies can then be more clearly investigated or evaluated within the contextual framework described here.

In this edition of *CJASN*, the first series describe the conceptual model of AKI and how it can be used to answer specific questions, as well as remaining questions regarding the epidemiology of AKI. In particular, we stress the need for better understanding and definitions that are applicable in a multitude of situations. The next article defines the evaluation and early management of AKI, with a major emphasis on the need to distinguish between volume-responsive and volume-unre-sponsive AKI in a systematic way. The last two articles describe the issues related to renal replacement therapy, particularly indications for and choices of therapy, and again describe key questions related to timing of therapy, defining optimal and minimal dosages of therapy. All of the articles use the definition of AKI recently published (1).

The importance of a conceptual model in which to study AKI cannot be overstated. Building on previous work in chronic kidney disease and using the expertise of basic and clinical science, a conceptual model of AKI was developed and refined, initially within one workgroup and subsequently with input from the entire 43 participants at the Vancouver AKIN meeting (September 2007). Briefly, the key aspects of the model include the description of a trajectory of disease from normal populations to at-risk populations to those with early reversible and late nonreversible disease, the ability to define a clear research agenda (both clinical and basic) at every stage of the model, and the concordance with existing accepted models of chronic kidney disease. The second article describes this model in detail.

This series of articles serves to focus the community on the importance of AKI as an entity, describe the myriad of possibilities in terms of research and clinical practice opportunities, and describe the current state of knowledge. Through ongoing clinical and research initiatives and leveraging the newly established Acute Kidney Injury Network, we hope to gain an understanding of how best to prevent and treat AKI so that ultimately we are able to improve patient outcomes.

The Vancouver conference and the articles in this *CJASN* selection build on the first AKIN conference held in Amsterdam in 2005 (1). The specific method used is described in the article by Kellum *et al.* (11) in this series and thus is not repeated in each article.

Disclosures
None.

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