

Acute Kidney Injury and Regenerative Medicine

Yoshio Terada • Takashi Wada • Kent Doi
Editors

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 Springer

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Preface

The disease concept of acute kidney injury (AKI) has been established in the last 10 years. In the past, the pathology associated with sudden renal impairment was characterized as acute renal failure (ARF). However, in the twenty-first century, the joint efforts of specialists in fields including nephrology, intensive care medicine, cardiovascular medicine, and pediatric nephrology have led to the development of a novel concept of AKI. Changes in the composition of the global population and in the incidence of disease, especially the rapid rise in chronic kidney disease (CKD) and diabetes mellitus, have increased the number of people at high risk for acute kidney injury. There is now widespread awareness of the surge in the frequency of AKI and of the fact that it markedly worsens patients' long-term prognoses. Thus, AKI was proposed as a novel disease concept to emphasize early diagnosis and early intervention for the improvement of prognoses.

Several types of diagnostic criteria of AKI have been introduced in the pursuit of a consistent international standard. Kidney Disease Improving Global Outcomes (KDIGO) guidelines (2012) are widely accepted as the criteria for the diagnosis of AKI. The Japanese Society of Nephrology, the Japanese Society of Intensive Care Medicine, the Japanese Society for Dialysis Therapy, the Japan Society for Blood Purification in Critical Care, and the Japanese Society for Pediatric Nephrology came together to develop "The AKI Clinical Practice Guideline 2016." In this guideline, we opted to use the term "AKI," which includes the existing concept of ARF. As the diagnosis of AKI is based on changes in the serum creatinine and the urine output only, it encompasses diverse pathologies. In clinical practice, AKI requires early diagnosis as well as constant differentiation of the causes (pre-renal, renal, and post-renal) and elimination of the reversible factors. Numerous clinical trials on early biomarkers for the diagnosis of AKI and treatments including renal replacement therapy (RRT) have also been published in the past few years. The chapters in this textbook on clinical fields were written by the authors of the recent AKI guideline (2016) and by internationally distinguished researchers.

Basic research on AKI has also made great progress in recent years. There have been many research results showing that the kidney and multi-organ linkages, especially the nervous system and immune system, are involved in the pathology of

AKI. There are great hopes that these basic research results will be clinically applied. Epidemiological studies have revealed that AKI shifts to CKD at a high rate, and that when AKI occurs, cardiovascular accidents increase and life expectancy decreases. Regenerative medicine research including that in iPS cells, which is given much attention today, has also made great progress in the field of kidney research.

In this textbook, the latest topics have been written by cutting-edge researchers on AKI and kidney regeneration. The epidemiology, early diagnosis, risk factors, and prevention and management of AKI are described in clinical chapters. In the basic research field, multiple organ linkages in AKI, AKI-to-CKD transition, and regenerative studies are from top international researchers. We hope this textbook will be useful not only to nephrologists but also to many physicians in other specialties and to basic researchers.

Finally, we wish to thank all the authors for their contributions to this volume.

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