Prevent the Event: Renal Protection in the Cardiac and Vascular Patient

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We are pleased to present this supplement to *Reviews in Cardiovascular Medicine* focusing on new concepts relating to the cardiorenal axis. This axis represents the close interdependence of the kidney and heart in maintaining optimal cardiovascular homeostasis. We feel fortunate to have assembled a world-renowned interdisciplinary faculty to discuss aspects of this topic in a series of fine articles.

An elegant presentation by Dr. McCullough from the Division of Nutrition and Preventive Medicine at William Beaumont Hospital describes the detrimental impact of even modest changes in renal function on cardiovascular events and defines the pathophysiology of this relationship.

The next topic to be addressed is radiocontrast nephropathy, an under-appreciated cause of acute renal failure in cardiac patients. Dr. Nikolsky and associates from the Cardiovascular Research Foundation at Lenox Hill Hospital present a wonderful review of the epidemiology and pathogenesis of radiocontrast nephropathy, as well as its prognostic implications. Following is my review of contemporary strategies for prevention of contrast nephropathy, with a focus on a novel selective dopamine receptor agonist, fenoldopam, and N-acetylcysteine.

Acute renal failure is a relatively common complication of cardiac and vascular surgery and, as in the case of contrast nephropathy, has ominous implications. Dr. Sheinbaum and colleagues from the Departments of Anesthesiology and Cardiothoracic and Vascular Surgery at the Unviersity of Texas present a thorough review of this subject. The mechanism of injury seems to be based on intra-operative tubular ischemia. Data supporting the inclusion of fenoldopam as part of a renal protection strategy for reducing mortality, morbidity, and length of stay is presented.

Dr. Nussmeier, from the Department of Cardiovascular Anesthesiology at the Texas Heart Institute, reviews both the pharmacologic and mechanical approaches to improving clinical outcomes in patients with end-stage heart failure. The Texas Heart Institute protocol for using fenoldopam in the setting of ventricular assist device placement and transplant is described.

Finally, Dr. Mathur from the Departments of Medicine and Nephrology and Renal Transplantation, University of California San Francisco, presents compelling evidence supporting the role of fenoldopam for patients with urgent, emergent, and postoperative hypertension, as well as in critically ill patients on ventilators and those undergoing liver transplantation.

The short half-life, ease of titration, and renal protective effects of fenoldopam make a case for its considered use in the appropriate clinical situation. Beyond its approved application for the treatment of severe hypertension, the other uses discussed throughout this supplement represent off-label non-FDA indications.

As program Chair, my objective in gathering this renowned multidisciplinary faculty was to develop a document that deals in an objective, contemporary, and comprehensive fashion with the issue of renal function and cardiovascular disease. By bringing together cardiologists, nephrologists, anesthesiologists, and cardiovascular surgeons to provide their unique perspectives, I feel that we have achieved this goal. I would like to thank each of the authors for their contribution to this effort.