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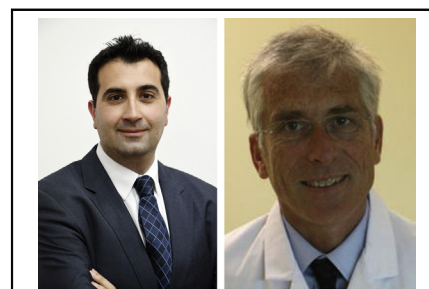
Commentary: Old sins have long shadows

Antonio Miceli, MD, PhD, and Mattia Glauber, MD

Acute kidney injury (AKI) is a frequent complication after cardiac surgery.¹ Depending on its definition, AKI occurs in 3% to 30% of patients and is associated with increased mortality, morbidity, and increased health care costs.² AKI has also an impact on long-term outcomes. Specifically, individuals with AKI have a 2-fold increased risk of new or progressive chronic kidney disease, a 4-fold increased risk of dialysis, and a 2-fold increased risk of death.³ The prevention of AKI and its consequences represents our goal to improve our results. It is required to know its pathophysiology and adopt therapeutic strategies to mitigate its impact on long-term mortality and morbidity. In this regard, the effect of AKI on long-term outcome has been less investigated.

In this issue of the *Journal*, Cho and colleagues⁴ evaluated the association between AKI and chronic kidney disease (CKD) development, emphasizing the intermediary role of acute kidney disease (AKD). In patients with normal preoperative renal function undergoing heart valve surgery, AKI occurred in 23.9% of patients. Among these, the prevalence of AKD and CKD was 15.1% and 12.5%, which was greater compared with those patients who did not develop AKI (4.7% and 4.2%). Interestingly, 88% of patients recovered from AKI. As expected, AKI increased the risk of AKD and CKD at 3 and 12 months. The new information is that patients who recovered early (within 3 days) from AKI are still at risk of developing renal failure. Specifically, these patients had still 3-fold increased risk of developing AKD and CKD at follow-up.

The relationship was more evident in patients with pre-existing renal disease. This study implies the importance of adopting some therapeutic strategies in patients who



Drs Antonio Miceli, MD, PhD, and Mattia Glauber, MD

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experienced AKI, especially in those with a normal preoperative renal function who recovered completely from AKI. In addition, authors highlighted the role of cardiac function in predicting long-term renal failure. Nevertheless, this study presents several potential confounding factors, which limit results. This study was conducted in patients undergoing valve surgery and does not reflect the overall population of cardiac surgery. The mechanism of valve disease affects the cardiac function in a different manner (concentric vs eccentric hypertrophy), especially in the presence of left ventricular dilatation. Then, some of these patients underwent myocardial revascularization for coronary disease, a well-known risk factor for worse early and long-term outcome. A more homogeneous population is required to give a better understanding of the problem. Heart failure was found to be a predictor of AKI and CKD but not of AKD at 3 months.

Heart failure is a complex and multifactorial disease that includes plenty of signs and symptoms of left ventricular dysfunction. Despite being well defined, the inclusion of more objective variables, such as left ventricular dimension, right ventricular function, and New York Heart Association class, might have given different results. Finally, a perspective is required. AKI continues to be a serious problem after cardiac surgery and associated with poor outcomes. We learned that patients with normal renal function who recover from AKI are still at risk for renal failure. Therapeutic strategies, which include the control of cardiac and renal modifiable risk factors as well as early referral to nephrologist specialist, are required to improve patient's survival.

From the Minimally Invasive Cardiac Surgery Department, Istituto Clinico San' Ambrogio, Milan, Italy.

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Address for reprints: Antonio Miceli, MD, PhD, Minimally Invasive Cardiac Surgery Department, Istituto Clinico San' Ambrogio, Via LG Faravelli 16, Milano, Italy (E-mail: antoniomiceli79@alice.it).

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