Commentary: The lack of a magic bullet

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Acute kidney injury (AKI) after cardiac surgery is a fearsome complication, affecting up to 30% of patients undergoing open surgery.¹ AKI is associated with increased in-hospital mortality, morbidity, and costs. Even minimal changes in creatinine levels are linked with increased risk of worse outcomes.²

It is well recognized that its effect on a patient's prognosis is poor in terms of survival and chronic kidney disease development up to 5 years after the initial insult.³ This adverse outcome might be due to the late recognition of AKI when the elevation of serum creatinine level is used. In this setting, early detection of impaired renal function in patients may help to ensure more aggressive treatment and to improve clinical outcome.

In this issue of the *Journal*, Ortega-Loubon and colleagues⁴ propose continuous kidney oxygen saturation monitoring as a noninvasive strategy to improve AKI detection. By using near-infrared spectroscopy, the authors identify the absolute kidney oxygen desaturations below 65% or declines greater than 20% from baseline value during the postoperative stage as a new marker for developing postoperative cardiac surgery AKI. Another interesting finding is that declines in kidney regional saturation during surgery were not correlated with postoperative AKI. Although this information is controversial, it adds evidence that AKI is a multifactorial disease and depends on many preoperative, intraoperative, and postoperative variables. To reduce the incidence of postoperative AKI, the authors suggested keeping an adequate perfusion pressure to optimize the cardiac output, enhance hydro-electrolytical replenishment, and avoid nephrotoxic drugs. The novelty of this study is the extension of the monitoring period up to 48 hours after the surgical operation, providing a wider timeframe to identify potential and possibly undetected noxae.

Nevertheless, this study faced the same obstacles of previous reports with near-infrared spectroscopy. The thresholds used to define desaturation are arbitrary, and no

AKI as center of target.

Central Message

New studies are widening our knowledge of AKI after open surgery, but we are still powerless in applying effective treatments and prevention measures.

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intervention protocol was used when it was recorded. Furthermore, the authors did not identify the presence of a “window of intervention” to modify outcomes, a major drawback of all studies using regional saturation monitor.⁵ As a result, this system has limited clinical significance. Other monitoring systems during cardiopulmonary bypass have been proposed in detecting AKI. Ranucci and colleagues⁶ showed that the use of goal-directed perfusion protocol, aimed to target intraoperative oxygen delivery to a value greater than 280 mL/min/m², is effective in reducing the less severe stage of AKI. However, it seems to be less effective in reducing the incidence of more severe stages. Promising studies are in progress to identify other potentially treatable triggers, such as right ventricular dysfunction.⁷

The dilemma is that after decades of research on prevention, early detection, and treatment, postoperative AKI is still an orphan of an effective therapy. We still need to find the “magic bullet” to defeat AKI.

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