

## Correspondence

### Assessing relation between preoperative serum creatinine levels and postoperative outcomes in patients undergoing open-heart surgery

To the Editor

The recent article by Ezeldin<sup>1</sup> assessing the relation between preoperative serum creatinine levels and postoperative outcomes in patients undergoing open-heart surgery was of great interest to us. This study showed that preoperative serum creatinine levels were strongly associated with postoperative morbidity and mortality. The strengths of this study are its large sample of patients, and the study included and adjusted for some of known risk factors affecting postoperative mortality and morbidity. Furthermore, the authors used appropriate methods to determine the relation between preoperative creatinine levels and observed endpoints. However, other than the limitations described in the discussion, we note other issues of this study making interpretation of their results questionable.

First, the preoperative hemoglobin and albumin levels, and body mass index (BMI) are not included in the demographic data of patients. It has been shown that preoperative anemia is common among cardiac surgery patients, and is an important risk factor for postoperative morbidity and mortality.<sup>2</sup> Furthermore, Engelman et al<sup>3</sup> demonstrated that in patients undergoing cardiac surgery, an albumin level of less than 2.5 g/dL is independently associated with increased risk of reoperation for bleeding, postoperative renal failure, prolonged ventilatory support, intensive care unit stay, and total length of stay. In addition, BMI has also been identified as a risk factor for adverse cardiac events and deaths after cardiac surgery.<sup>3</sup>

Second, this study did not include preoperative cardiac medications. In the setting of cardiac surgery, preoperative statin, calcium antagonists, and  $\beta$ -blockers therapies have been associated with significant decreased risks for postoperative complications such as death, myocardial infarction, and acute kidney failure. Furthermore, statins in combination with  $\beta$ -blocker therapy reduces postoperative stroke after coronary artery bypass graft surgery.<sup>4</sup> We believe that the results of this study would have been more informative if these factors were taken into account.

Third, this study did not include details of perioperative hemodynamic changes and management. Consequently, it is difficult to estimate the extent to which these factors might have influenced outcomes. In cardiac surgery patients, highly positive intraoperative fluid balance and hemodilution anemia (a hematocrit of <24%) are significantly associated with postoperative

adverse outcomes. Perioperative transfusion is one of the most significant confounders and is strongly associated with increased early and late mortality. Actually, patients receiving transfusion are consistently identified as being at higher risk for postoperative complications in all categories. Furthermore, perioperative administration of inotropes, vasopressors, antiarrhythmics, and diuretics may influence the development of acute kidney injury after cardiac surgery.<sup>5</sup> Thus; we cannot exclude the possibility that these factors would have confounded the analysis of their results.

Finally, Ezeldin<sup>1</sup> did not clearly describe whether the mortality used in this study is hospital mortality, 30-day mortality, or longer-term mortality, though preoperative serum creatinine levels have different influences on short- and long-term mortality of patients undergoing on-pump cardiac surgery. It is generally believed that early postoperative mortality is most likely related to the surgery and perioperative management, and lasts approximately one month. However, the longer-term postoperative mortality primarily represents the natural process of aging or potential diseases.

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#### Reply from the Author

No reply was received from the Author.

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