Identifying Risk Factors for Acute Kidney Injury After Pediatric Cardiac Surgery

To the Editor:
We read with great interest the article by Lee et al., assessing risk factors and outcomes of acute kidney injury (AKI) after pediatric cardiac surgery in a retrospective review study. By their multivariable regression analysis, they showed that body weight, height, body surface area, and preoperative mechanical ventilation were independently associated with the development of postoperative AKI. Surprisingly, however, age, severity of the cardiac procedure according to RACHS, use of cardiopulmonary bypass, cardiopulmonary bypass and aortic cross-clamping times, which are widely accepted risk factors of AKI after pediatric cardiac surgery, were not associated with AKI development. Other than a small AKI patient group, this was a retrospective study, which potentially introduces a number of confounders. We argue that not taking several perioperative factors affecting the development of AKI after pediatric cardiac surgery into the model would have affected the inferences of multivariable regression analysis for risk factors of AKI.

First, as a routinely measured variable, perioperative hemoglobin levels were not provided. Park et al. showed that a low preoperative hemoglobin level and postoperative hemoglobin concentration increase >3 g/dL from the preoperative level on the first postoperative day were independent risk factors for AKI after cardiac surgery in infants and children. Second, intraoperative transfusion of blood products was not included in the multivariable model, though it has been significantly associated with AKI in children undergoing cardiac surgery with cardiopulmonary bypass. Most importantly, the authors did not provide the intraoperative hemodynamic data, especially the occurrence of hypotension, a known causative factor of postoperative AKI. Patterson et al. determined that reduced renal perfusion pressure by a lower mean arterial pressure and a higher vasoactive inotrope score has been significantly associated with AKI in children following the Fontan procedure: Impact of renal perfusion pressure by a lower mean arterial pressure and a higher vasoactive inotrope score as a tool for clinical care in children post cardiac surgery. Indian J Crit Care Med 2014; 18: 653–658.


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The available literature reveals that early postoperative fluid overload, platelet count <80,000/mm³ or a decline of 50% from the highest value recorded over the last 48 h, low cardiac output syndrome, prolonged mechanical ventilation duration, increased lactate levels and sepsis are risk factors for AKI after pediatric cardiac surgery. We believe that the results of this study would be more conclusive and informative if the above perioperative risk factors for AKI were included in the multivariable model as far as possible.

Acknowledgments
None of the authors had financial support or potential conflicts of interest to declare for this work.

Disclosures
Before submission, we screened our manuscript for plagiarism using the Plagiarism Checker (www.duplichecker.com) and no any plagiarism is found.

References