Identifying Risk Factors for Acute Kidney Injury After Pediatric Cardiac Surgery
—Reply—

We appreciate the interest of Dr. Fu-Shan Xue and colleagues regarding our paper published in the Circulation Journal. They raise the issue of other risk factors that were not mentioned in our paper. In addition, they suggest that these risk factors might have significantly influenced the development of acute kidney injury (AKI) after the pediatric cardiac surgeries reported in our study.

As highlighted by Dr. Xue, we then attempted to re-analyze several perioperative risk factors that affect the development of AKI after pediatric cardiac surgery. The results were as follows. First, among the patients in our study group, none showed low perioperative hemoglobin levels or increases in postoperative hemoglobin concentration by >3g/dL on the first postoperative day.

Second, during the preoperative stage, none of the patients in the non-AKI group and only 1 patient in the AKI group had low cardiac output. Furthermore, none of the patients in the AKI group had both an episode of hypotension and low cardiac output. The intraoperative vasoactive scores did not show a statistically significant difference between the AKI and non-AKI groups (4.35±3.46 and 4.3±3.27, respectively). No significant differences in the number of transfusions were found between the groups. Furthermore, we think that the degree of influence depends on the type of transfused blood components and that the total number of transfusions may be meaningful.

In the article cited by Dr. Xue and colleagues, Patterson et al. studied the theory that renal perfusion pressure may decrease in early post-Fontan patients with low mean arterial pressures and high central venous pressures. The result could not demonstrate the theory. Similarly, in our study, surgeries for severe cardiac diseases, including Fontan operation, were not a risk factor in the multivariable regression analysis.

Third, none of the postoperative adverse events, including early postoperative fluid overload, decreased platelet count, low cardiac output syndrome, prolonged ventilation duration, increased lactate level, and sepsis, were risk factors statistically.

In conclusion, we agree that the risk factors mentioned may influence the mechanism of AKI development after pediatric cardiac surgery, but we found no evidence of development of AKI in our study.

Finally, we again thank Dr. Xue and colleagues for their careful review and thoughtful comments on our study.

References