Commentary on “Predictors of Acute Kidney Injury After Hip Fracture in Older Adults”

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Keywords
acute kidney injury, hip fracture, risk factors, older patients

Dear Sir,

In the recent article by Braüner Christensen et al1 determining the predictors of acute kidney injury (AKI) after hip fracture in older patients, in addition to the limitations described by authors in discussion, there were other methodological issues that were not well addressed. We would like to invite the authors to comment.

First, in statistical analysis, the authors described that the variables with a 2-tailed P value of less than 0.05 were examined further in the multivariate analysis with binary logistic regression with AKI (present or not) as the dependent variable. This method of building multivariable model is questionable. Generally speaking, establishment of a multivariable mode should include the 3 steps: a) Initial comparison of cohorts experiencing and not experiencing AKI is performed, as described in the Tables 1 and 2 of their article1; b) The variables with statistical significance in the initial comparison, defined as P < 0.05, are incorporated into the univariate model to examine multicollinearity among candidate independent variables and obtain unadjusted odds ratio, P value and 95% confidence interval of each variable; c) Finally, the variables with large P values (P < 0.2) in the univariate model are included into the multivariate model to identify the independent risk factors of AKI, with their adjusted odds ratios, P values and 95% confidence intervals.2 As step b has not been taken by Braüner Christensen et al,1 their results are subject to bias due to multicollinearity.

Second, when the multivariate analysis was used to determine the risk factors of postoperative AKI in this study, preoperative (comorbidities, pulse pressure at admission and use of antihypertensive drugs), intraoperative (blood loss) and postoperative factors (blood transfusion) were separated to enter into the models for statistical adjustment. It must be emphasized that AKI after noncardiac surgery is a result of complex interactions among many basic and perioperative factors.3 To determine the risk factors of postoperative AKI and the true contribution of each risk factor to the occurrence of postoperative AKI, thus, all factors associated with the occurrence of AKI identified by the univariate analysis should be together inputted into the multivariate model for statistical adjustment.2 Because of this methodological limitation, we argue that the results of multivariate analysis for identifying the risk factors of postoperative AKI would have been distorted.

Third, this study observed postoperative serum albumin and hemoglobin levels and showed that 2 variables were significantly lower in patients with AKI. However, it was unclear why they were not taken into the multivariate model identifying the risk factors of postoperative AKI. In fact, postoperative hypoalbuminemia and anemia have been identified as the independent risk factors of AKI following hip surgery.4,5 Furthermore, this study assessed the occurrence of AKI within 7 days after surgery and showed a higher postoperative C-reactive protein in patients with AKI. However, the readers were not provided with the details of the postoperative complications. It has been shown that postoperative complications, such as infection, sepsis and acute myocardial infarction, have been independently associated with an increased risk of AKI.6

We believe that clarifying above mentioned methodological issues will improve the transparency of this study and the interpretation of findings.

Author Contributions
All authors had carefully read the manuscript of Braüner Christensen et al, analyzed their methods and data. Z-FH suggested comment points and drafted this manuscript, F-SX critically revised comment points and this manuscript, and is the author responsible for this

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manuscript. KS revised comment points and this manuscript. All authors had seen and approved the final manuscript.

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