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## Letter to the Editor

### Is early postoperative hypoalbuminemia really a risk factor for acute kidney injury after hip fracture surgery?



To the editor,

With interest we read the recent article by Shin and Han [1] assessing the association of early postoperative hypoalbuminemia with acute kidney injury (AKI) after hip fracture surgery. By many statistical methods including multivariate logistic regression analyses, inverse probability of treatment weighting, propensity score matching, and propensity score matching weighting analyses, they showed that minimal early postoperative serum albumin level <2.9 g/dL was an independent risk factor for AKI. Given that AKI is significantly associated with increased risks of morbidity and mortality after hip surgery [2], their findings have potentially clinical implications. Other than the limitations described by the authors in discussion, however, we noted several issues in this study that needed further clarifications.

First, the optimal cutoff value of postoperative albumin level for prediction of AKI was determined based on the Youden index according to the receiver operating characteristic curve analysis. On the basis of an optimal cutoff value of 2.9 g/dL, patients were stratified into the two groups with minimal early postoperative serum albumin levels <2.9 and ≥2.9 g/dL. However, we noted that the area under the receiver operating characteristic curve (AUROC) only was 0.653. Generally, the AUROC can be interpreted as excellent (0.9–1), good (0.75–0.89), fair (0.6–0.74), low (0.5–0.59), or fail/no (<0.5) predictive value [3]. In clinical practice, moreover, the cutoff value of serum albumin level used for diagnosis of hypoalbuminemia is <3.5 g/dL, rather than <2.9 g/dL. That is, their study actually evaluate the association of severely postoperative hypoalbuminemia with the risk of postoperative AKI. Thus, it is better that title of this article is changed into “Severe hypoalbuminemia in the early postoperative period is a risk factor for postoperative AKI following hip fracture surgery”.

Second, the author did not provide the Youden index at the optimal cutoff value of 2.9 g/dL. Apart from being able to provide

the optimal cutoff value, the Youden Index also is a direct measure of diagnostic accuracy at the optimal cutoff value [4]. According to the AUROC and Youden index at the optimal cutoff value, sensitivity, specificity, positive and negative predictive values of postoperative albumin level <2.9 g/dL for prediction of AKI can be obtained. Because of this limitation, it was unclear whether the use of minimal early postoperative serum albumin level < 2.9 g/dL to predict postoperative AKI had a good discrimination ability.

Third, patients with a postoperative serum albumin level <2.9 g/dL had a significantly lower preoperative albumin level than those with a postoperative serum albumin level ≥2.9 g/dL. Because the details of perioperative management were not provided, it was unclear whether a decreased serum albumin level in early postoperative period was a continuation of existed preoperative event or was attributable to intraoperative and postoperative factors. It should be emphasized that a decreased preoperative serum albumin level has been independently associated with an increased risk of postoperative AKI after noncardiac surgery [5]. That is, if the decreased postoperative serum albumin level was regarded as a confounder for multivariable statistical adjustment in this study, the low preoperative serum albumin level might become a significant risk factor for postoperative AKI after hip surgery.

Finally, when multivariable statistical adjustments were used to determine the risk factors for AKI after hip surgery, some intraoperative and postoperative risk factors associated the occurrence of AKI were not included in the model. The recent evidence shows that duration of operation, intraoperative bleeding, postoperative anemia, blood transfusion, acute myocardial infarction, and sepsis are the important risk factors for AKI following hip surgery [6–8]. Thus, not taking above intraoperative and postoperative factors into the model would have biased the inferences of multivariable statistical adjustments for minimal early postoperative serum albumin level <2.9 g/dL as a risk factor for prediction of postoperative AKI.

In the view of above design limitations, we argue that this retrospective observational study cannot answer question well whether early postoperative hypoalbuminemia is a real risk factor for AKI following hip fracture surgery.

### Authors' contributions

**Rui-Juan Guo:** This author had carefully read the manuscript of *Shin and Han*, analyzed their methods and data, suggested the comment points, drafted this manuscript. **Rui-Juan Guo** had seen and approved the final manuscript.

**Fu-Shan Xue:** This author had carefully read the manuscript of *Shin and Han*, analyzed their methods and data, revised comment points and this manuscript, and is the author responsible for this manuscript. **Fu-Shan Xue** had seen and approved the final manuscript.

**Liu-Jia-Zi Shao:** This author had read the manuscript of *Shin and Han*, and helped to analyze their methods and data, revised this manuscript. **Liu-Jia-Zi Shao** had seen and approved the final manuscript.

**Li Zheng:** This author had read the manuscript of *Shin and Han*, and helped to analyze their methods and data, and revise this manuscript. **Li Zheng** had seen and approved the final manuscript.

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## Letter to the Editor

### Regarding reverse total shoulder arthroplasty for the treatment of failed fixation in proximal humeral fractures



Dear Editor and Authors,

We read your research paper [1] recently with interest and discussed it in our journal club and had the following comments to make;

- 1 Your abstract presents this as a study of 270 Reverse total shoulder replacements (RTSAs). This seems slightly misleading as 265/270 patients were then excluded and we felt it would have been more accurately presented as a case series identified from a database of 270 RTSAs.
- 2 The stated purpose of the study was 'to present outcomes of RTSA after failure of fracture fixation' but there is no mention of a power calculation to see the numbers needed to show this. We feel a study of 5 patients is likely to significantly underpowered to do this. It is certainly underpowered compared to the larger case series which you have used for comparison [2–5].
- 3 Your group have performed a similar study where you looked at 42 patients who underwent primary RTSA for fracture [6]. Surely this would have provided an excellent point for statistical comparison

and could better have answered your aim 'to present outcomes of RTSA after failure of fracture fixation'. We also noted that you have previously used DASH/EQ5D/HRQoL in previous studies and were interested to know why it was not used in this study?

- 4 You have stated in your results that 'There were no intra-operative or post-operative complications in RTSA surgeries', however, you also report that 1/5 patients had revision for stiffness (20%) and that another patient was offered revision for stiffness but declined. It is not entirely clear in your methods how you have defined a complication, but surely stiffness significant enough that revision surgery was offered in 40% (2/5) of your case series represents a post operative complication.
- 5 Finally, with regard to the editing process of your paper, it would appear that a full sentence has been repeated in the discussion section and that arthroplasty has been spelt incorrectly in the title, which is disappointing given the normal high quality of the journal.

Overall, whilst we enjoyed reading your paper, we felt that the limitations above make it impossible to make any meaningful conclusions for the intended purpose of your study.

## Conflicts of interest

None.

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