

LETTER

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# Prediction of acute kidney injury in intensive care unit patients

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See related research by Naruse et al., <https://ccforum.biomedcentral.com/articles/10.1186/s13054-018-2120-z>

In their recent article assessing the predictive ability of urinary liver-type fatty-acid binding protein and serum N-terminal pro-B-type natriuretic peptide for acute kidney injury (AKI) in patients treated at a medical cardiac intensive care unit (ICU), Naruse et al. [1] did not provide any severity score, such as the APACHE II score or the SOFA score. The available evidence shows that patients' severity of illness and level of organ failure upon admission to the ICU are independently associated with the occurrence of AKI [2, 3].

Furthermore, it was unclear whether the serum creatinine levels used for diagnosis of AKI had been corrected based on fluid balance. It has been shown that not adjusting serum creatinine levels for fluid balance can underestimate the incidence and severity of AKI in the ICU patients, as a positive fluid balance can dilute serum creatinine [4].

Finally, the discriminative ability of risk prediction models for AKI was assessed by *c*-statistic, but the calibration was not performed with the Hosmer-Lemeshow test. The calibration assesses the ability of a prediction model to match the number of actual events across deciles of risk-stratified subgroups. A  $P < 0.05$  indicates poor calibration of the prediction model or a lack of fit between two models [5].

## Abbreviation

AKI: Acute kidney injury

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## Authors' contributions

RJG, FSX, and LJZS carefully read the manuscript by Naruse et al. and analyzed their methods and data. RJG suggested comment points and drafted this manuscript. FSX and LJZS revised the comment points and this manuscript. FSX is the author responsible for this manuscript. All authors read and approved the final manuscript.

## Ethics approval and consent to participate

Not applicable.

## Consent for publication

Not applicable.

## Competing interests

The authors declare that they have no competing interests.

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## References

1. Naruse H, Ishii J, Takahashi H, Kitagawa F, Nishimura H, Kawai H, et al. Predicting acute kidney injury using urinary liver-type fatty-acid binding protein and serum N-terminal pro-B-type natriuretic peptide levels in patients treated at medical cardiac intensive care units. *Crit Care*. 2018; 22:197.
2. Zhang Y, Jiang L, Wang B, Xi X. Epidemiological characteristics of and risk factors for patients with postoperative acute kidney injury: a multicenter prospective study in 30 Chinese intensive care units. *Int Urol Nephrol*. 2018; 50:1319–28.
3. Trongtrakul K, Poopipatpab S, Pisitsak C, Chittawatanarat K, Morakul S. Acute Kidney Injury in Elderly Patients in Thai-Surgical Intensive Care Units (THAI-SICU) study. *J Med Assoc Thai*. 2016;99(Suppl 6):S209–18.
4. Macedo E, Bouchard J, Soroko SH, Chertow GM, Himmelfarb J, Ikinz TA, et al. Program to Improve Care in Acute Renal Disease Study. Fluid accumulation, recognition and staging of acute kidney injury in critically-ill patients. *Crit Care*. 2010;14:R82.
5. Merkow RP, Hall BL, Cohen ME, Dimick JB, Wang E, Chow WB, et al. Relevance of the *c*-statistic when evaluating risk-adjustment models in surgery. *J Am Coll Surg*. 2012;214:822–30.

