Reviewer's report

Title: Detection of decreased glomerular filtration rate in intensive care units: serum cystatin C versus serum creatinine

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Reviewer: Samra Abouchacra

Reviewer's report:

The authors identified and investigated an important clinical question related to appropriate estimation of renal function in the setting of critical illness. With serum creatinine being a poor indicator of underlying renal function and the numerous specific caveats for GFR estimating formulae, better predictors of renal function are constantly being sought especially in the context of acute changes in renal function.

The protocol was simple, appropriate and easy to follow with data of sound scientific basis and adequately analyzed. The discussion is balanced and supported by the data with the results potentially constituting sound addition to scientific knowledge. There are a few limitations of minor nature which require addressing by the authors prior to acceptance for publication. Overall the paper is well written with the title appropriately chosen.

Major Compulsory Revisions

1) The baseline comorbidities of the study sample including prior history of CKD and cause of admission to ICU need to be included and discussed in the context of the study findings.

2) Although the authors mention taking into account confounders of Cystatin C measurement, important others notably the effect of CPR in raising its levels need further exploration. This is especially important for this cohort of patients who may have underlying or superimposed sepsis as part of their critical illness. History of smoking may also be important and deserves addressing relevant to the duration of ICU admission.

3) The role of other biomarkers such as NGAL (being a specific indicator of tubular injury) needs to be discussed given the high likelihood of acute tubular injury occurrence in ICU-related illnesses. As such the suspected etiology of AKI in the study patient cohort should also be disclosed and discussed in relation to diagnostic utility of Cystatin vs NGAL biomarkers.

4) With the prevalent use of GFR estimating formulae, authors should elaborate as to their preference to use the reciprocal of serum creatinine as opposed to use of eGFR including the use of cystatin based- formula.

- Minor Essential Revisions
in order to (i) diagnosing acute kidney injuries, (ii) preventing further degradation of renal function and (iii) adjusting the needs to be corrected as below: in order to i) diagnose... ii) prevent further deterioration ... iii) adjust the

SCysC against an unquestionable method of GFR measurement. The real advantage of SCysC Would suggest: reliable, gold standard instead of unquestionable

iohexol clearance below 60 mL/min/1.73 m². The reciprocal of SCysC better correlates to

suggest correlated

context of ICU. Thus, our data confirm in an unambiguous way the superiority of SCysC over SCr in critically ill patients. Confirm in an “unambiguous way” is too strong would use words like: suggests, may support...

e) Conclusion last sentence

More generally, we believe that SCysC is a more valid GFR biomarker than SCr in ICU and as such, might be evaluated as part of the AKI definition/classification in replacement of SCr. Last part of the conclusion is too strong as “guideline- changing” esp given study limitations.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests: I declare that I have no competing interests