Reply to "The Royal Free Hospital Cirrhosis Glomerular Filtration Rate: Validation in a Danish Cohort."

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This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1002/hep.29391

We thank Dr Pedersen and colleagues for their interest in our work (1) and we welcome the external validation of the Royal Free Hospital Cirrhosis Glomerular Filtration Rate (GFR) (2). As a general comment, the equation performs very well in this independent cohort and only slightly underestimates true GFR, unlike widely used formulas such as the MDRD. We would also like to discuss a few additional points.

Firstly, since the publication of our article we have discovered an error in the originally reported formula and we have submitted an erratum, which is in press. The correct formula should read:

$GFR = 45{\cdot}9 \times (creatinine^{-0.836}) \times (urea^{-0.229}) \times (INR^{-0.113}) \times (age^{-0.129})$

$\times (sodium^{0.972}) \times 1{\cdot}236 (\text{if male}) \times 0{\cdot}92 (\text{if moderate/severe ascites})$.

We presume that the GFR underestimation will be less pronounced should the authors use the corrected formula.

Secondly, Cr-51 EDTA measurement in patients with ascites is more reliable when plasma samples are taken up to 24 hours post injection rather than just 6 hours (3, 4). This could have resulted in small inaccuracy of the “gold standard” measurement in the Danish cohort.

Thirdly, it would be of interest if the authors could show how did the Royal Free Hospital cirrhosis GFR perform compared to other widely used GFR formulas in this independent dataset. This would encourage a more widespread use of this equation.

Ultimately, as we mentioned in our article, it would be valuable to explore if the incorporation of this cirrhosis-specific GFR equation instead of creatinine in prognostic scores such as MELD improves their performance; we are in the process of testing this using data from the NHS British Transplant database.

1. Pedersen J, Kimer N, Henriksen J, Bendtsen F, Møller S. The Royal Free Hospital Cirrhosis Glomerular Filtration Rate: Validation in a Danish Cohort. Hepatology 2017;In Press.

2. Kalafateli M, Wickham F, Burniston M, Cholongitas E, Theocharidou E, Garcovich M, O'Beirne J, et al. Development and validation of a mathematical equation to estimate glomerular filtration rate in cirrhosis: The royal free hospital cirrhosis glomerular filtration rate. Hepatology 2017;65:582-591.

3. Wickham F, Burniston MT, McMeekin H, Hilson AJ, Burroughs AK. Validation and impact of a new technique for assessment of glomerular filtration rate in patients with liver disease. Nucl Med Commun 2015;36:168-179.

4. Wickham F, Burniston MT, Xirouchakis E, Theocharidou E, Wesolowski CA, Hilson AJ, Burroughs AK. Development of a modified sampling and calculation method for isotope plasma clearance assessment of the glomerular filtration rate in patients with cirrhosis and ascites. Nucl Med Commun 2013;34:1124-1132.