Reviewer's report

Title: The GFR estimated by different new and old equations as a predictor of important outcomes in elderly patients

Version: 1
Date: 13 November 2013

Reviewer: Guido Filler

Reviewer's report:

Major Compulsory Revisions:

- The authors make one major assumption, namely that the definition of CKD is an eGFR < 60 mL/min/1.73 m² regardless of age. This needs to be discussed carefully. Firstly, KDIGO and KDOQI define CKD stage II as a measured GFR less than 90 mL/min/1.73 m², and CKD stage III is defined as a GFR of less than 60. This is NOT the definition of CKD as a whole. Secondly, elderly patients have similarities with infants with regards to GFR. Because of the gradual recruitment of nephrons in a similar fashion as the in-utero formation, GFR does not reach its final level until 18-24 months of age. Nobody would consider a newborn with a physiological GFR of 10 mL/min/1.73 m² as having CKD. Similarly, GFR deteriorates over the life span and an 80-year old may well have a physiological GFR of 50 mL/min/1.73 m² that is considered normal. Ideally, age-independent z-scores should be used to define CKD. Suggested reading: Pediatr Nephrol. 2013 Jul;28(7):991-4. and Kidney Int. 2011 Sep;80(6):567-8. This entire aspect is completely ignored and needs to be included in the introduction and the discussion.

- Clarify that the CKD-EPIcreatcyst, CKD-EPIcyst, and BIS equations include cystatin C, which is an independent marker of cardiovascular morbidity and mortality. This may confound the results.

- Include a short paragraph on the strengths and weaknesses of both cystatin C and serum creatinine, particularly in view of the elderly population studied.

- Include short statements about the strengths and weaknesses of the formulae used for the study. Include the appropriate literature (the authors may wish to review Clin Chem Lab Med. 2012 Dec;50(12):2081-91 for a possible format as a table.)

Minor essential revisions:

- Provide the total imprecision of both the IDMS traceable creatinine and the cystatin C measurements.

- It seems that standardized calibrators for cystatin C were not used, but rather the commercially available standards were adjusted. How was this done?

- How was normal distribution assessed? Provide the details.
- Provide details about missing data and how these were handled.

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I have conducted extensive research on cystatin C and measurement of GFR in children and adults.