

Importance of the creatinine calibration in the estimation of GFR by MDRD equation

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Sir,

We read with great interest the recent article by Van Biesen *et al.* [1] on the standardization of creatinine and the implications for chronic kidney disease (CKD) management. We fully agree with the general conclusions. However, we would like to make some comments about the methodology. Using correcting formulae to convert 'routine serum creatinine' to 'MDRD creatinine' is mandatory. Van Biesen *et al.* have thus used correction formulae and chosen those published by Froissart [2], Hallan [3] and Coresh [4]. However, we think that such correction formulae are only valid when applied to the respective creatinine methods used in these publications: modified kinetic Jaffé method after deproteinization (Bayer RA-XT, Konelab 20) for Froissart, blanked kinetic Jaffé (Roche Diagnostics, Hitachi 917) for Hallan and modified kinetic Jaffé (Boehringer Mannheim, Hitachi 737) for Coresh. It should also be stressed that Froissart and Coresh have directly recalibrated their creatinine values with the MDRD laboratory, Cleveland, while Hallan used an 'indirect' correction based on published data. In our University of Liège, we directly recalibrated our creatinine (rate-blanked compensated Jaffé method, Roche Diagnostics, Modular P analyzer) with the Cleveland laboratory ($\text{creatinine}_{\text{MDRD}} = 1.003 \times \text{creatinine} + 0.1413$) and we compared the results with those obtained by indirect correction based on data published by Hanser *et al.* [5] ($\text{creatinine}_{\text{MDRD}} = 1.058 \times \text{creatinine} + 0.039$). If both corrected creatinine are used with the simplified MDRD (for a white man of 60 years old), the differences between the calculated GFR values are greater than 5 ml/min/1.73 m² for serum creatinine concentrations below 0.89 mg/dl.

Problems linked to calibration may be overcome using a traceable (gold standard) serum creatinine measurement (like isotope dilution mass spectrometry) [6]. However, other limitations exist for the use of the MDRD equation in a non-CKD population. The MDRD formula was built from a CKD population and thus cannot be applied to a non-renal population because creatinine-GFR relationship is not the same in both populations (creatinine tubular secretion raises when GFR declines) [2,3]. Finally, the relationship between GFR and serum creatinine being exponential, very slight changes in serum creatinine concentration induce great modifications in MDRD formula results. The precision of all Jaffé methods is relatively poor. Analytical bias in serum creatinine determination may induce enough changes in creatinine values to explain the lack of accuracy of MDRD formula in non-CKD population [7].

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Conflict of interest statement

We have no conflict of interest to declare.

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