Erratum

Correction

Lin J, *et al.*: Comparison of Prediction Equations for Estimating Glomerular Filtration Rate in Adults without Kidney Disease. *J Am Soc Nephrol* 14: 2573–2580, 2003

A reader has correctly pointed out that we made an error in standardizing the Cockcroft-Gault (CG) and Jellife-1 equations for a body surface area (BSA) of 1.73 m^2. We multiplied these equations by BSA/1.73 m^2 when we should have multiplied by 1.73 m^2/BSA. We submit the highlighted corrected data in Table 1 below alongside the previously reported values for comparison. Absolute differences decreased for the CG equations, and Pearson correlation and precision improved slightly. Of note, the bias was negative for both CG equations, indicating that the CG equation underestimated true measured GFR (especially with the CG-GFR equation), and the accuracy of the CG equations improved to be comparable to accuracy of the MDRD equations. The effects on the predictive ability of the Jellife-1 equation were less marked, and resulted in an increased negative bias and decreased precision and accuracy. When data was stratified by type of clearance study (^{125}I-Iothalamate *versus* ^{99m}Tc-DTPA) as in the original report, very similar results were seen with an increased negative bias, precision, and accuracy with the two CG equations. All other previously reported data, including those for the MDRD equations, are not affected by this error. We must therefore revise some of our original conclusions. The CG equations also appear to underestimate measured GFR in adults without kidney disease, and the accuracy of the CG equations are comparable to those of the MDRD equations. These data do still show, however, that estimation equations are less than optimal for evaluating GFR in healthy adults with serum creatinine in the normal range.

These findings are supported by other recent publications. Rule *et al.* analyzed 274 potential kidney donors (serum creatinine, 0.7 to 1.6 mg/dl) who underwent iothalamate clearance studies and found a bias of −29 ml/min per 1.73 m^2 for the MDRD2 equation and a bias of −14 ml/min per 1.73 m^2 for the CG equation standardized to BSA. Correlation coefficients were 0.26 and 0.30 for MDRD2 and CG, respectively (1). Poggio *et al.* analyzed 457 potential kidney donors with iothalamate clearance and reported a median difference of −9.0 ml/min per 1.73 m^2 and a median absolute difference of 16 ml/min per 1.73 m^2 for GFR estimates by the MDRD2 (2). These two studies concluded, as did ours, that the MDRD2 equation significantly underestimates measured GFR in adults without kidney disease, and that a formula developed in a cohort with moderate to severe chronic kidney disease understandably does not perform well in adults without chronic kidney disease. Because estimation equations are essential in large cohort studies and are important in clinical settings such as kidney donation, we advocate further study and the development of more precise, more accurate, and less biased prediction equations for adults with serum creatinine in the normal range.

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References

1. Rule AD, Gussak HM, Pond GR, Bergstralh EJ, Stegall MD, Cosio FG, Larson TS: Measured and estimated GFR in healthy potential kidney donors. *Am J Kidney Dis* 43:112–119, 2004
2. Poggio ED, Wang X, Greene T, Van Lente F, Hall PM: Performance of the modification of diet in renal disease and Cockcroft-Gault equations in the estimation of GFR in health and in chronic kidney disease. *J Am Soc Nephrol* 16:459–466, 2005

Table 1. Mean calculated CrCl or GFR, mean absolute difference, bias, precision, and accuracy of GFR prediction equations compared to measured GFR

	Mean CrCl/GFR (range)	Mean Absolute Difference	Median Absolute Difference	Median % Absolute Difference	Bias	R^2 (Precision)	Pearson Correlation	Accuracy % within: 30%	50%
CG	129.6 ± 48.8 (50.1–288.5)	37.9	26.7	23%	16.8	0.06	0.24	58%	79%
CORRECTED CG	***107.5 ± 28.9 (57.8–259.2)***	***24.5***	***21.5***	***19%***	***−5.3***	***0.09***	***0.30***	***78%***	***97%***
CG-GFR	108.9 ± 41 (42.1–242.3)	32.9	30.5	25%	−4.0	0.06	0.25	59%	83%
CORRECTED CG-GFR	***90.3 ± 24.2 (48.6–217.7)***	***28.5***	***27.5***	***24%***	***−22.5***	***0.09***	***0.30***	***61%***	***96%***
MDRD 1	97.6 ± 25 (55.8–201.1)	32.9	30.6	25%	−15.2	0.03	0.17	69%	96%
MDRD 2	94.5 ± 25 (50.3–184.9)	28.7	23.5	22%	−18.3	0.02	0.15	65%	95%
Jelliffe 1	92.3 ± 22.1 (55.3–176.0)	26.0	26.5	23%	−13.2	0.05	0.23	67%	96%
CORRECTED JELLIFFE-1	***86.5 ± 25.1 (50.3–166.8)***	***26.0***	***26.9***	***26%***	***−26.3***	***0.03***	***0.16***	***61%***	***88%***

Estimation equations:

(1) Cockcroft-Gault (CG): CrCl × (1.73 m^2/BSA): CrCl = ([(140 − age) × weight (kg)]/SCr × 72) × 0.85 (if female)

(2) Cockcroft-Gault GFR (CG-GFR) estimate: GFR = 0.84 × CrCl by Equation (1)

(3) MDRD 1: GFR = 170 × $(SCr)^{-0.999}$ × $(age)^{-0.176}$ × (0.762 if female) × (1.18 if black) × $(BUN)^{-0.170}$ × $(Alb)^{0.318}$

(4) MDRD 2: GFR = 186 × $(SCr)^{-1.154}$ × $(age)^{-0.203}$ × (0.742 if female) × (1.212 if black)

(5) Jellife 1: (1.73 m^2/BSA): (98 − [0.8 × (age − 20)])/(SCr × [0.90 if female])

CrCl, creatinine clearance; BSA, body surface area; SCr, serum creatinine; MDRD, Modification of Diet in Renal Disease; BUN, blood urea nitrogen; Alb, albumin.

Correction

Sela S, *et al.*: Primed Peripheral Polymorphonuclear Leukocyte: A Culprit Underlying Chronic Low-Grade Inflammation and Systemic Oxidative Stress in Chronic Kidney Disease. *J Am Soc Nephrol* 16: 2431–2438, 2005

In Table 1, found on page 2432, the correct unit of measurement for serum CRP should be mg/L. The authors regret this error.

 ISSN: 1046-6673/1609-2814