Reporting the eGFR and Its Implication for CKD Diagnosis

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The process of diagnosing chronic kidney disease using the estimated GFR involves several pitfalls. The estimated GFR laboratory report should be requested only by practitioners who are familiar with how to interpret the result. Until a more reliable method is available to estimate the GFR, the current chronic kidney disease classification should be revised by reducing the central role of the GFR cutoff levels.

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We read the debate regarding estimated GFR (eGFR) with interest and make the following comments (1,2). Drs. Glassock and Winearls are essentially correct that eGFR reporting is actually mandatory. The Kidney Disease Outcomes Quality Initiative Clinical Practice Guidelines for Chronic Kidney Disease (K/DOQI-CKD) stated in guideline 4, "Clinical laboratories should report an estimate of GFR using a prediction equation, in addition to reporting the serum creatinine measurement" (3), where "should" expresses obligation or duty and leaves little option for voluntary participation despite the severe limitations of this practice.

The good news was clinicians were reminded that there could be up to 50% GFR loss before the serum creatinine (SCr) becomes "abnormal," for which the K/DOQI-CKD panel should be commended. The bad news was that the National Kidney Disease Education Program subsequently recommended that GFR >60 ml/min per 1.73 m^2 should not be reported by the laboratories because the Modification of Diet in Renal Disease (MDRD) formula is not reliable above this level (4). For example, an eGFR of 64 ml/min per 1.73 m^2 in a 25-yr-old white woman (corresponding to a SCr of 1.1 mg/dl) or an eGFR drop from 109 to 77 ml/min per 1.73 m^2 in a 45-yr-old white man (corresponding to a SCr rise from 0.8 to 1.1 mg/dl), both with "normal" SCr but significant clinical implications, will not be evident in the laboratory report (*i.e.*, back to square 1, when SCr was solely used to assess the renal function); therefore, a normal GFR range according to age and gender should be included in the laboratory eGFR report. This will also help to resolve the particular concern, expressed by both publications in the debate, for the large number of elderly with GFR <60 ml/min per 1.73 m^2 and no other markers of CKD. After all, it is worth remembering that K/DOQI-CKD stated that "the 'cutoff levels' between stages are inherently arbitrary."

Drs. Melamed, Bauer, and Hostetter argued that "reporting an eGFR with the serum creatinine delivers what the practitioner is really requesting." Ordering two SCr tests in a span of 3 mo, with eGFR reports <60 ml/min per 1.73 m^2, will automatically diagnose a patient with CKD, something the practitioner did not request. For example, if the patient were in the process of recovering from acute renal failure, or a therapy with an inhibitor of the angiotensin-renin system were initiated, then the practitioner was requesting just the index of renal function, but according to the K/DOQI-CKD classification, a new disease was diagnosed. Requesting a laboratory test is done after thorough assessment of a particular case. The result should be interpreted in the clinical context, keeping in mind the sensitivity and the specificity of the test, before implementing it in the diagnostic process. We could not agree more with Drs. Melamed, Bauer, and Hostetter that interpretation of the eGFR requires judgment and knowledge but in a completely different context of this issue. Precisely, because of the current knowledge that the formulas used for eGFR have numerous limitations, as some of them were described by Drs. Glassock and Winearls, the eGFR report should be requested only by practitioners who are familiar with all of the pitfalls of its interpretation.

Certainly, the eGFR is a very helpful additional tool to asses the renal function, provided that there is a reliable method for proper estimation of the GFR. Previously, we reported that the Cockcroft-Gault (CG) and MDRD formulas had significant limitations for purpose of the K/DOQI-CKD classification for 1339 patients (5). Additional analysis of our study showed that the CG and MDRD formulas misclassified overall 39.8 and 44.0% of the entire population, respectively. Another study, including 2095 patients, reported that both formulas "led to inappropriate staging of approximately 30% of subjects" in the overall population, and for the five GFR groups according to the K/DOQI-CKD classification, the range of misclassification was 22.1 to 57.0% and 21.2 to 36.3%, range of sensitivity was 43.0 to 77.9% and 62.7 to 78.9%, and range of specificity was 84.5 to 99.5% and 86.1 to 99.3% for the CG and MDRD formulas, respectively (6). Furthermore, the paradoxic effects of the MDRD formula, when applied to different populations by gender and race and in health and CKD, were already discussed elsewhere (7,8).

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Finally, Drs. Melamed, Bauer, and Hostetter stated that "using the staging system, the kidney disease may be overstated"; "however, in practice, the renal insufficiency is still underdiagnosed." We hope that this is not an attempt to imply that the benefit of reporting eGFR, by increasing the awareness for CKD, is justifying some misdiagnosing.

In summary, we believe that a laboratory report for SCr should not include automatically the eGFR. A more reliable method is needed to estimate the GFR in its entire spectrum (*i.e.*, in health and disease). Until then, the current K/DOQI-CKD classification should be revised by reducing the central role of the GFR cutoff levels. In our daily practice, we all should adhere to the first rule of practice of medicine: *Primum non nocere.*

Disclosures

None.

References

1. Glassock RJ, Winearls C: Screening for CKD with eGFR: Doubts and dangers. *Clin J Am Soc Nephrol* 3: 1563–1568, 2008
2. Melamed ML, Bauer C, Hostetter TH: eGFR: Is it ready for early identification of CKD? *Clin J Am Soc Nephrol* 3: 1569–1572, 2008
3. K/DOQI clinical practice guidelines for chronic kidney disease: Evaluation, classification, and stratification. *Am J Kidney Dis* 39[Suppl 1]: S1–S266, 2002
4. National Kidney Disease Education Program: Laboratory Professionals: Reporting eGFR. Available at: http://www.nkdep.nih.gov/labprofessionals/reporting_eGFR.htm. Accessed September 2008
5. Botev RC, Mallié JP, Couchoud C, Schück O, Fauvel JP: Limitations in using the Cockcroft-Gault and modified diet in renal disease formulae for chronic kidney disease classification [Abstract]. *J Am Soc Nephrol* 16: 508A, 2005
6. Froissart M, Rossert J, Jacquot C, Paillard M, Houillier P: Predictive performance of the modification of diet in renal disease and Cockcroft-Gault equations for estimating renal function. *J Am Soc Nephrol* 16: 763–773, 2005
7. Rule AD, Textor SC: Cardiovascular risk linked to chronic kidney disease—but who actually has chronic kidney disease? *Mayo Clin Proc* 80: 1267–1269, 2005
8. Rainey PM: Automatic reporting of estimated glomerular filtration rate: Jumping the gun? *Clin Chem* 52: 2184–2187, 2006