Kidney disease and calibration of creatinine determination: where are we in Brazil?

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Recommendations dictate that serum creatinine levels be measured using specific kits calibrated based on international standards using isotope dilution mass spectrometry (IDMS). According to laboratory quality management organizations, the total analytical error associated with the measurement of creatinine levels must be routinely monitored. And last but not least, laboratories should report the glomerular filtration rates (GFR) calculated from established formulas (such as the CKD-EPI) alongside creatinine serum levels.[1]

The purpose of these recommendations is to increase the accuracy of GFR estimates based on creatinine levels, the parameter that best describes renal function.

In practical terms, when recommendations are not followed, GFR levels and the ensuing clinical judgment are distorted. For example, various modified test methods based on the Jaffe reaction may underestimate serum creatinine values in individuals with high levels of serum bilirubin or overshoot them by as much as 20% in patients on cephalosporin due to analytical interferences.[2] Possible deleterious consequences such as incorrect diagnosis of renal disease, inadequate dosage of drugs excreted via the kidneys, and delayed referral to nephrology care may occur as a result of improper serum creatinine level measurement.

The level of compliance to recommendations among Brazilian laboratories is unknown. Neither the Brazilian Health Surveillance Agency [(ANVISA), contact number 2014676521] or the Brazilian Society of Clinical Pathology and Medical Laboratories [(SBPC/ML), call center] have that information.

An independent survey carried out with 42 laboratories from all over Brazil revealed that 14 (33%) labs did not use traceable methods or *IDMS* to measure serum creatinine levels (Alcântara FFP, 2010). One may assume that this ratio is even greater in the Brazilian countryside, considering the widespread availability of kits not adequately calibrated to measure serum creatinine levels. Laboratories not participating in quality assessment programs are believed to have total analytical error levels above recommended thresholds.

This is a preoccupying scenario for a number of reasons. First, the GFR estimated from serum creatinine is a cornerstone in the diagnosis and stratification of patients with chronic kidney disease (CKD) and acute kidney injury (AKI). Additionally, GFR is more than an indicator of renal function, as it is directly associated with risk of cardiovascular death and global mortality.[1,3]

The Brazilian Ministry of Health recently passed legislation concerning specifically the policies around the care

provided to patients with CKD.[4] And in it, the diagnosis and stratification of patients with CKD is based on the GFR. Considering that more than 10 million Brazilians have some degree of CKD, the quality of the care provided to this population may be severely affected if serum creatinine levels are inaccurately measured.

Encouraging the standardization of serum creatinine level measurement at a national level may become an important step toward improving the diagnosis and stratification of individuals with CKD and AKI. This measure might have an important role in the prevention and treatment of kidney disease. Additionally, the addition of the estimated GFR level alongside the serum creatinine level in test reports may increase the sensitivity of kidney disease detection.[5]

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