Letter by Ribichini et al Regarding Article, “Cystatin C and Contrast-Induced Acute Kidney Injury”

To the Editor:

On May 18, 2010, Briguori et al reported in *Circulation* that “in patients with chronic kidney disease, cystatin C seems to be a reliable marker for the early diagnosis and prognosis of contrast-induced nephropathy (CIN).”\(^1\) The authors investigated whether changes in cystatin C levels 24 hours after contrast media exposure anticipate the occurrence of CIN (absolute increment of serum creatinine [SC] ≥0.3 mg/dL at 48 hours), and if this could predict 12-month major adverse events such as death and need for dialysis. They found that a 24-hour increment in cystatin C levels ≥10% compared with baseline is a good predictor of CIN, with excellent negative predictive value (100%) and specificity (85.9%). They also defined 3 groups of patients on the basis of the changes of cystatin C at 24 hours and SC at 48 hours and found that estimated glomerular filtration rate and the groups including patients with ≥10% cystatin C increase predicted major adverse events.\(^1\)

The authors are to be commended for the valuable information regarding the 1-year outcome of CIN, an important clinical finding that is largely missing in the literature. However, we would like to note that the authors did not compare early percent variations of cystatin C and of SC for CIN prediction, and that differences found when comparing absolute and percent variations from baseline may likely be driven by the peculiarity of the 2 types of measurements rather than by the differences between the 2 biomarkers.

For example, an increment of 0.3 mg/dL of SC in a patient with 0.7 mg/dL at baseline represents a +42.8% increment; this change would be easily detected with both methods. However, if the absolute increment is slightly lower (0.25 to 0.29 mg/dL), the diagnosis of CIN would be missed by the absolute measurement, but the percent changes would be +35.7% and +41.4%, respectively, values that are certainly detected by a 10% cutoff. This higher “sensitivity” of the percent changes applies not only to subjects with normal SC but also to patients with moderate or severe renal damage: Creatinine 1.7 mg/dL plus 0.25 mg/dL (CIN not detected) corresponds to +14.7% increment (CIN detected); creatinine 2.3 mg/dL plus 0.25 mg/dL (CIN not detected) corresponds to +11% increment (CIN detected). Therefore, the sensitivity and specificity to predict CIN of the 2 methods will be different, regardless of the biomarker that is tested.

Without discussing the potential advantages and disadvantages of SC and cystatin C as indicators of renal function,\(^2\) we think that a universally available biomarker such as SC is often undervalued in its potential to detect patients who will develop CIN based on the monitoring of absolute values after contrast exposure. Indeed, a +5 to +10% change from baseline corresponds to SC elevations that would be considered negligible in clinical practice, but such changes predict the occurrence of CIN and persistent renal damage with high sensitivity and specificity without any additional cost to routine biochemical determinations.\(^3\)

Compared with SC, determination of cystatin C is much more expensive and time consuming, and its cost-effectiveness remains undetermined. Percent changes from baseline should replace routine monitoring of absolute values (of either SC or cystatin C) for better and earlier detection of CIN.

Disclosures

None.

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References

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