3. Shlipak MG, Katz R, Sarnak MJ, Fried LF, Newman AB, Stehman-Breen C, et al. Cystatin C and prognosis for cardiovascular and kidney outcomes in elderly persons without chronic kidney disease. Ann Intern Med. 2006;145:237–46.
4. Koenig W, Twardella D, Brenner H, Rothenbacher D. Plasma concentrations of cystatin C in patients with coronary heart disease and risk for secondary cardiovascular events: more than simply a marker of glomerular filtration rate. Clin Chem. 2005;51:321–7.
5. García Acuña JM, González-Babarro E, Grigorian Shamagian L, Peña-Gil C, Vidal Pérez R, López-Lago AM, et al. La cistatina C aporta más información que otros parámetros de función renal en la estratificación del riesgo de los pacientes con síndrome coronario agudo. Rev Esp Cardiol. 2009;62:510–9.
6. Cepeda J, Tranche-Iparraguirre S, Marín-Iranzo R, Fernández-Rodríguez E, Riesgo-García A, García-Casas J, et al. Cistatina C y riesgo cardiovascular en población general. Rev Esp Cardiol. 2010;63:415–22.

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Assessment of Renal Involvement by Cystatin C: A Forgotten Biomarker. Response

Valoración de la afección renal mediante la cistatina C: un biomarcador olvidado. Respuesta

To the Editor,

We appreciate the interest shown in our study published in your journal[1] and would like to make a few comments on the subject. As described by Domínguez-Rodriguez and Abreu-Gonzalez, serum cystatin C (CC) is a biological marker both for determining renal function and for cardiovascular prognosis, with enormously promising medical implications. In recent studies, CC has provided an estimated glomerular filtration rate (GFR) almost as accurate as traditional formulae based on creatinine levels adjusted for age, sex, and race, independently of the patient's muscle mass. An equation that includes CC in combination with serum creatinine levels, age, sex, and race provides even more exact estimates.[2]

Given the widespread circulation of *Revista Española de Cardiología*, the primary goal of the article was to inform the reader as to the importance of evaluating renal involvement as an early detection method for individuals with a high risk of cardiovascular events and promote swift action, all from a clinical standpoint.[1] Since CC is not commonly determined in clinical practice, it was not addressed in the review. We would thus like to thank these comments, which add to the information provided in the article.

However, despite the fact that CC could be a promising marker for renal function, for the stratification of the risk, specially in those patients with intermediate risk, there are certain limitations to the standardized use of CC as such a marker. To be specific:

- There is no standard reference value for measuring CC, and there is a great deal of intra-individual variability.[3]
- CC concentrations increase with age, especially in patients older than 80 years.[4] Thus, it is not clear whether increases in CC in these patients are related to different levels of renal function or other factors that are unrelated to GFR.
- Several different factors influence CC levels, such as hypothyroidism, some inflammation markers such as C-reactive protein, treatment with steroids, body fat, and diabetes.[5]
- Few laboratories have the capability to measure CC, and the cost is still quite higher than for determining GFR using serum creatinine levels.

Therefore, until the technique has become standardized and more cost-effective methods of measurement have been developed, we should focus on ensuring that 100% of patients with cardiovascular diseases have their GFR and urinary albumin excretion determined using formulas derived from creatinine levels and the urine albumin/creatinine ratio, respectively.

This does not mean that CC is not a viable marker, but its role in the detection of cardiovascular risk and GFR determination has not been well established. It is probably simply a matter of time.

Jose Luis Górriz Teruel* and Sandra Beltrán Catalán

Servicio de Nefrología, Hospital Universitario Dr. Peset, Valencia, Spain

* Corresponding author:
E-mail address: jlgorriz@senefro.org (J.L. Górriz Teruel).

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REFERENCES

1. Górriz Teruel JL, Beltrán Catalán S. Valoración de afección renal, disfunción renal aguda e hiperpotasemia por fármacos usados en cardiología y nefrotoxicidad por contrastes. Rev Esp Cardiol. 2011;64:1182–92.
2. Stevens LA, Astor BC. Estimating GFR using serum cystatin C alone and in combination with serum creatinine: a pooled analysis of 3,418 individuals with CKD. Am J Kidney Dis. 2008;51:395–406.
3. Caravaca F. Cistatina C sí pero... Nefrologia. 2006;26:421–5.
4. Shlipak MG, Sarnak MJ, Katz R, Fried LF, Seliger SL, Newman AB, et al. Cystatin C and the risk of death and cardiovascular events among elderly persons. N Engl J Med. 2005;352:2049.
5. Knight EL, Verhave JC, Spiegelman D, Hillege HL, De Zeeuw D, Curhan GC, et al. Factors influencing serum cystatin C levels other than renal function and the impact on renal function measurement. Kidney Int. 2004;65:1416.

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