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NEPHROLOGY - LETTER TO THE EDITOR

The fourth wave in chronic kidney disease (CKD) classification: taking into account the aging kidney

Carlos G. Musso[1,2] · Ana C. Ricardo[3] · Gustavo Aroca-Martinez[2,4]

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Editor,

CKD affects more than 10% of the population worldwide, is strongly associated with accelerated cardiovascular morbimortality, and its prevalence is exponentially higher among older individuals, although this prevalence is just based on estimated GFR (eGFR) and albuminuria [1]. The *first* CKD classification (2002) was proposed by the KDOQI group; it divided CKD into five categories based on eGFR. This classification was subsequently endorsed by the KDIGO organization. The *second* CKD classification (2008) subdivided stage 3 into stages 3a and 3b (45–59 and 30–44 ml/min/1.73 m^2, respectively), and incorporated the presence or absence of albuminuria [2]. The *third* and currently used KDIGO CKD classification (2012) added the albuminuria level: normal (A1), moderate (A2), and severe (A3) [3]. The positive impact that implementation of the current classification has had is not debatable, however it does not take into consideration the age of the patient. Experts in nephrogeriatrics have long suggested that eGFR declines as we age. The rate of decline has been suggested to be ~ 1 ml/min per year, since 40 years of age, and the age-expected GFR (aeGFR) can be calculated using the equation developed by Keller et al. [4, 5]; aeGFR (ml/min) = 130 – age in years (± 5).

Renal aging (RA), in clear contrast to CKD, is associated with normal serum creatinine, hemoglobin, calcium-phosphorus metabolism, urinalysis, kidney imaging findings, and the same mortality risk as the general older population [4–9]. Distinction between RA and CKD is very important because of the increasing older population, which will result in an increasing number of persons inaccurately being categorized as having CKD [10]. This misdiagnosis implies negative psychological (depression), economic (higher health cost) and clinical consequences of prescribing unnecessarily low protein diet (sarcopenia), and RAS blockers (electrolytes and GFR alterations). To this effect, we propose a simple modification of the current CKD classification that incorporates an age-calibration (Fig. 1). In this staging system, we propose that the cells where CKD G3a and G3b intersect with the A1 column, be considered a "*white flag*" area, indicating that before labeling the older adult as having CKD, there should be a careful evaluation to determine whether the eGFR decrease represents RA. We propose to name these two *white flag* areas as *alfa (*G3a), and *omega* (G3b) for easier designation. This could be done as follows: for individuals 70–85 years old with eGFR (45–59 ml/min/1.73 m^2), albuminuria < 30 mg/g (KDIGO stage G3a/A1), and normal serum creatinine level (≤ 1 mg/dl), according to Keller's formula, the aeGFR would be 45–60 ml/min/1.73 m^2, therefore, a more detailed evaluation (e.g. renal ultrasound, urinary sediment, hemoglobin, bone-mineral metabolism) is needed before making the diagnosis of CKD. Similarly, in persons 86–100 years of age with serum creatinine ≤ 1 mg/dl, the aeGFR would be 30–44 ml/min/1.73 m^2, therefore, further evaluation would be necessary to decide whether the GFR decline is due to RA or CKD.

In conclusion, we propose a simple modification to the current KDIGO CKD classification to avoid the current state of over diagnosing CKD in healthy older individuals.

✉ Carlos G. Musso
carlos.musso@hospitalitaliano.org.ar

1 Nephrology Department. Hospital Italiano de Buenos Aires, Perón 4190, Buenos Aires, Argentina

2 Facultad de Ciencias de La Salud, Universidad Simón Bolivar, Barranquilla, Colombia

3 Department of Medicine, Division of Nephrology, University of Illinois Chicago, Chicago, IL, USA

4 Clinica de La Costa, Barranquilla, Colombia

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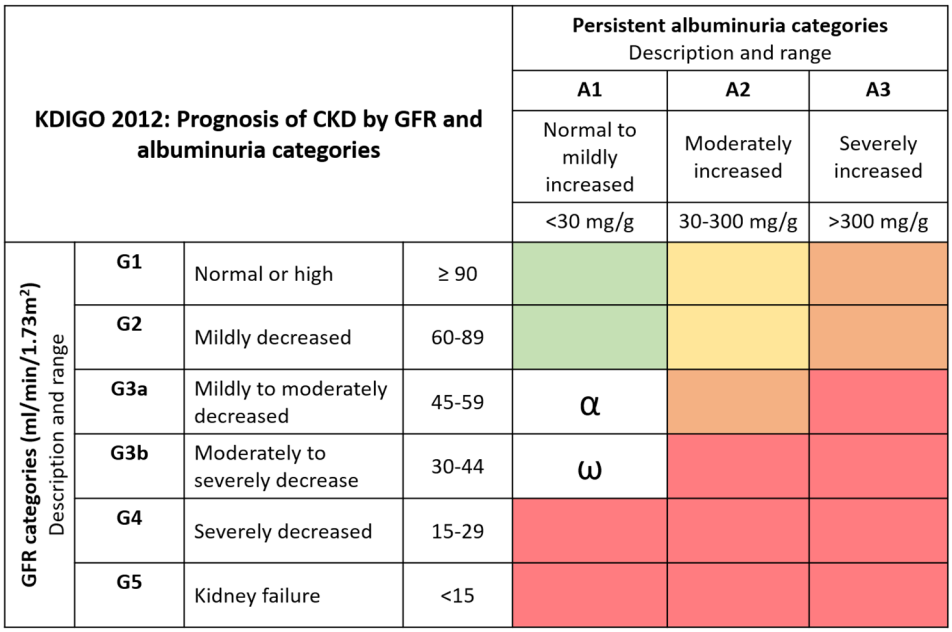

Fig. 1 Green low risk, yellow moderately increased risk, orange high risk, red very high risk, white additional testing needed. Alfa (α), age 70–85 years; (ω), age 86–100 years: with serum creatinine ≤ 1 mg/dL, additional testing recommended to differentiate between renal aging and CKD

Data availability Not applicable.

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