Sir,

In 2004, the Acute Dialysis Quality Initiative (ADQI) developed a consensus definition of acute kidney injury (AKI): the risk, injury, failure, loss and end-stage kidney disease (RIFLE) criteria [1]. AKI is divided into three classes (risk, injury and failure) based on urine output or a rise in serum creatinine compared to baseline creatinine. Often, a baseline creatinine value is not available. In that case, ADQI recommends back-estimation using the Modification of Diet in Renal Disease (MDRD) formula, assuming an estimated glomerular filtration rate (eGFR) of 75 mL/min/1.73m² [1]. It is known that this formula leads to under- and over-classification of AKI [2]. Since GFR decreases with age, the use of eGFR 75 mL/min/1.73m² might result in over-classification in the elderly. Several alternative methods have been suggested, e.g. the use of creatinine value taken at the time of hospital admission, the use of the lowest creatinine level during admission, calculating baseline creatinine by using a newly developed equation or the use of a gender-fixed eGFR [2]. However, none of these alternatives offered an improvement compared to the MDRD-based estimates [2].

In our study, we investigated the use of an age- and gender-adjusted eGFR to classify patients according to the RIFLE criteria compared with the use of a fixed eGFR of 75 mL/min/1.73m².

We analysed data from 271 patients >18 years of age, hospitalized with community-acquired pneumonia, who participated in two consecutive trials [3, 4]. Serum baseline creatinine (defined as creatinine-actual) was obtained by searching for creatinine values in hospital and general practice. The numbers of under- and over-classification in specific RIFLE classes are shown for both groups in Figure 1. Especially for patients aged >76 years, RIFLE classification was more accurate with the use of an age- and gender-adjusted eGFR (Figure 1).

We conclude that use of an age- and gender-adjusted eGFR is more comparable with actual baseline creatinine values compared to a back-calculated value with a fixed eGFR of 75 mL/min/1.73m². However, further research is needed to evaluate whether this age- and gender-adjusted eGFR classification in RIFLE class has the same prognostic value on outcome compared with the classification in RIFLE class based on the actual baseline creatinine.

Conflict of interest statement. None declared.

1Department of Internal Medicine, St. Antonius Hospital, Nieuwegein, The Netherlands,
2Department of Internal Medicine, University Medical Centre Groningen, Groningen, The Netherlands

Correspondence and offprint requests to: Willem Jan W. Bos; E-mail: w.bos@antoniusziekenhuis.nl

References

1. Bellomo R, Ronco C, Kellum JA et al. Acute renal failure—definition, outcome measures, animal models, fluid therapy and information technology needs: the Second International Consensus Conference of the Acute Dialysis Quality Initiative (ADQI) Group. Crit Care 2004; 8: R204–R212
2. Zavada J, Hoste E, Cartin-Ceba R et al. A comparison of three methods to estimate baseline creatinine for RIFLE classification. Nephrol Dial Transplant 2010; 25: 3911–3918
3. Meijvis SC, Hardeman H, Remmelts HH et al. Dexamethasone and length of hospital stay in patients with community-acquired pneumonia: a randomised, double-blind, placebo-controlled trial. Lancet 2011; 377: 2023–2030
4. Endeman H, Meijvis SC, Rijkers GT et al. Systemic cytokine response in patients with community-acquired pneumonia. Eur Respir J 2011; 37: 1431–1438
5. Wetzels JF, Kiemeneij LA, Swinkels DW et al. Age- and gender-specific reference values of estimated GFR in Caucasians: the Nijmegen Biomedical Study. Kidney Int 2007; 72: 632–637

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Fig. 1. RIFLE classification calculated with actual creatinine compared to RIFLE classification based on use of a fixed eGFR of 75 mL/min/1.73m² (creatinine-75) and compared to RIFLE classification based on use of an age-and-gender-adjusted eGFR (creatinine-age).