Calculation of Creatinine Clearance Based on Unadjusted Body Weight Leads to Errors in Renal and Heart Failure Patients

To the Editor:

Renal insufficiency characterizes a high-risk heart failure patient subset. McAlister et al., in a prospective study of a cohort of 754 heart failure patients, found a high prevalence of renal failure (56% with creatinine clearance [CCr] < 60 mL/min). They reported that renal failure predicts a 1% mortality increase with each 1 mL/min decrease in CCr. CCr in their study was calculated by the Cockcroft-Gault formula using actual body weight. This formula calculates CCr based on serum creatinine, age and weight without considering height and body surface area.2 This simplification leads to little error in most adults but may be less accurate in obese patients and those with fluid overload.3

Although McAlister et al1 state that <25% of patients had fluid overload, the mean body weight of study patients increased with decreasing CCr, as follows: 62 kg (CCr > 90 mL/min), 71 kg (CCr 60 to 89 mL/min), 82 kg (CCr 30 to 59 mL/min), and 96 kg (CCr < 30 mL/min) (P < 0.001). We believe that this body weight increase is likely from fluid overload from renal and/or heart failure and less likely from obesity. In such circumstances, as suggested by Cockcroft and Gault,2 a correction to lean body weight should be used in the CCr formula.

Although we agree with the authors that use of actual body weight overestimates CCr and if anything underestimates the association between renal function and outcomes,1 we feel that their “short cut” is unnecessary when calculating the most important variable in the study. Height is a readily available parameter and ideal body weight can be easily determined from a nomogram.

We ask that the authors provide CCr based on lean body weight and that they report the patient’s lean as well as the actual body weight. We suspect that as CCr calculated by lean body weight falls, the lean body weight in the various groups will not be statistically significant as suggested in the original table.1

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