A Simple Assessment of the Renal Function in Geriatric Patients

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for the renal function: the index < 0.75 implies $CL_{Cr} < 50$ ml/min. The ability to detect $CL_{Cr} < 50$ ml/min was compared between the index and Scr using a data set from work published earlier [5] which had investigated the relationship between measured and estimated CL_{Cr} in 26 nursing home residents (22 males and 4 females, mean age 87.6 years, mean BW 65 kg, mean Scr

Dear Sir,

Measurement of the 24-hour creatinine clearance (CL_{Cr}) is indicated when renally eliminated drugs are prescribed to older patients because of their diminishing renal function. However, in the elderly, the incomplete collection of 24-hour urine often makes it unreliable [1].

Most of the guidelines for drug therapy in renal insufficiency recommend to adjust drug dosages corresponding to the $CL_{Cr} < 10$, $10 < CL_{Cr} < 50$, and $CL_{Cr} < 50$ ml/min [2]. From this point of view, most pre-scribers may be satisfied with a convenient index detecting $CL_{Cr} < 50$ ml/min even without actual CL_{Cr} in routine practices. For instance, Algotsson et al. [3] have proposed a simple measure of body weight (BW)/serum creatinine (Scr) ratio for dosage adjustments of digoxin in the elderly (> 70 years). Thus, we attempted to ascertain whether the BW/ Scr ratio could well distinguish patients with $CL_{Cr} < 50$ ml/min from those with $CL_{Cr} > 50$ ml/min.

The equation of Cockcroft and Gault [4], the most well-known one for estimating the CL_{Cr} , embodies the BW/Scr ratio as follows:

$$CL_{Cr} = [1.2 (140 - \text{age})] [BW/Scr] CF \quad (1)$$

where the CL_{Cr} is expressed in milliliters per minute, the age in years, the BW in kilograms, and the Scr in micromoles per liter; CF indicates the correction factor (CF = 1 for males and CF = 0.85 for females). Supposing patients from 70 to 100 years of age, application of age = 85 and $CL_{Cr} = 50$ to the equation yields (BW/Scr) CF = 0.75. We then considered the (BW/Scr) CF as an index

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Weight/Creatinine ratio with correction factor

Fig. 1. Relationship between actual creatinine clearance and body weight/serum creatinine ratio with correction factor.

106 μmol/l). In this paper, the upper limit of the normal Scr value was regarded as 130 μmol/l. Of 8 patients with the index ≥ 0.75 , only 1 patient (13%) had an actual CLcr < 50 ml/min. Of 18 patients with the index < 0.75, 14 patients (78%) had an actual CLcr < 50 ml/min (fig. 1). On the other hand, as much as 13 of 23 patients with Scr ≤ 130 μmol/l

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(47%) had an actual CLcr < 50 ml/min, whereas all 3 patients with Scr > 130 μmol/l had an actual CLcr < 50 ml/min.

A simple index has been developed for assessing the renal function of ambulatory patients over 70 years of age: the patients should be considered as having a CLcr < (>) 50 ml/min, if the BW/Scr ratio < (>) 0.75 for males or < (>) 0.9 for females. As shown above, the use of the Scr only results in critical overpredictions of CLcr, while the predictability is significantly improved only by taking one more convenient factor, BW, into physician's consideration. The simple index may contribute to safer drug prescriptions to the elderly, especially on an outpatient basis.

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