Estimated Creatinine Clearance by the Formula of Gault and Cockcroft in Renal Transplantation

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Dear Sir,

The determination of creatinine clearance is used to assess a decrease in glomerular filtration. This requires the measurement of creatininemia and creatininuria, and the total collection of 24-hour urine. Because of the difficulty in verifying urine collection and the fluctuation of creatinine excretion, the value of creatinine clearance can be mistaken. Consequently, Gault and Cockcroft [1, 2] suggested the use of a formula for predicting creatinine clearance from only plasma or serum creatinine: creatinine clearance

(ml · min⁻¹) = (140 - age in years) × (body weight in kg)^{0.725} × 72 × creatininemia in mg/100 ml

creatinine clearance

(ml · min⁻¹) = (140 - age in years) × (body weight in kg)^{0.725} × 0.814 × creatininemia in μmol/l

and

creatinine clearance

(ml · s⁻¹) =

(140 - age in years) × (body weight in kg) 48.8 × creatininemia in μmol/l

with 15% less in females.

The validity of this formula is, however, questioned [3–7]. In order to decide whether this formula can be useful in following up renal transplantation, we studied in the present work the creatinine clearance as estimated by the formula of Gault and Cockcroft in 59 kidney transplant recipients (33 males and 26 females; age: 38 ± 11 years, mean ± SD). In parallel, creatinine clearance was also calculated from plasma and urine creatinine as measured by the Jaffé technique on an Astra-8 Beckman autoanalyzer.

Table I. Correlation between measured and estimated creatinine clearance (ml · s⁻¹) by the formula of Gault and Cockcroft

As shown in table 1, a good correlation was found between measured and estimated creatinine clearance. In addition, simultaneous determination of creatinine clearance by both methods clearly demonstrated (fig. 1) that the day to day variability of measured values was higher and

that wrong values may thus be used. However, this does not preclude measured creatinine clearance from being useful because estimated creatinine clearance can be modified independently of glomerular filtration by hydric retention which alters the body weight of patients. Therefore, we think that creatinine clearance both measured and estimated by the formula of Gault and Cockcroft can be associated with improving the follow-up of renal function in patients with renal transplants.

Estimated Creatinine Clearance in Renal Transplantation

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10
0
20
30
40
60
80
100 120

Time after transplantation, days

Fig. 1. Mesured (O) and estimated (•) creatinine clearance in a patient after renal transplantation. The two arrows indicate a blatant mistake in the measured creatinine clearance.

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