

ESTIMATION OF GLOMERULAR FILTRATION RATE IN ELDERLY PATIENTS – EXTERNAL VALIDATION OF TWO NOVEL EQUATIONS

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INTRODUCTION. Estimation of glomerular filtration rate (GFR) is essential for the evaluation of patients with chronic kidney disease (CKD). Recently, two novel equations that use both serum creatinine and cystatin C concentration (The Chronic Kidney Disease Epidemiology Collaboration formula (CKD-EPI creatinine & cystatin) and Berlin Initiative Study (BIS2)) were proposed as new GFR markers (1,2). The aim of our study was to perform external validation of both novel equations in our elderly CKD patients.

PATIENTS, METHODS. 106 adult Caucasian patients, older than 65 years (58 women, 48 men; mean age 72.5 years), were included. In each patient ⁵¹CrEDTA clearance, serum creatinine (IDMS traceable method) and serum cystatin C (immunonephelometric method) were determined. GFR was calculated using the CKD-EPI creatinine & cystatin formula and BIS2 formula.

RESULTS. The mean ⁵¹CrEDTA clearance was 52.2±15.9 ml/min/1.73m², mean serum creatinine 141.4±41.5 µmol/l, mean serum cystatin C 1.79±0.6 mg/l. Statistically significant correlations between ⁵¹CrEDTA clearance and both formulas were found (P<0.0001). In the ROC curve analysis (cut-off for GFR 45 ml/min/1.73m²) no significant difference of diagnostic accuracy between CKD-EPI creatinine & cystatin formula and BIS2 formula was found (P=0.843) (area under the ROC curve for both formulas was 0.948). Bland and Altman analysis for the same cut-off value showed that CKD-EPI creatinine & cystatin formula (bias: -18.3 ml/min/1.73m²) and BIS2 formula (bias: -18 ml/min/1.73m²) underestimated measured GFR. All equations lacked precision. It was 8.8 ml/min/1.73m² for CKD-EPI creatinine & cystatin formula and 8.3 ml/min/1.73m² for BIS2 formula. Analysis of ability to correctly predict patient's GFR below or above 45 ml/min/1.73m² showed similar ability for both formulas (CKD-EPI creatinine & cystatin formula (61.3%) versus BIS2 formula (63.2%) (P=0.89)).

CONCLUSIONS. Our external validation of novel formulas indicates that both sophisticated formulas are equally accurate and reliable markers of GFR in Caucasian elderly CKD patients.

REFERENCES:

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