Abstract: 1938

Evaluation of creatinine based methods for estimating glomerular filtration rate in heart failure

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Topic(s):
Chronic Heart Failure: Comorbidities

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Background: Glomerular filtration rate (GFR) is an important factor in management of heart failure. 51CrEDTA based clearance is a method for exact measure of GFR (mGFR) but these and other reference methods are not applicable in large number of patients why estimated GFR (eGFR) is preferred in clinical practice.

Purpose: To validate creatinine-based equations for renal function against 51CrEDTA based clearance in a heart failure population.

Methods: All patients within a predefined catchment area, diagnosed with heart failure, who underwent 51CrEDTA clearance between 2010 and 2018 were included. eGFR were estimated using Cockcroft-Gaults ideal and actual weight (CGIW and CGAW), The Modification of Diet in Renal Disease Study (MDRD), simplified MDRD (sMDRD), The Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI), Lund-Malmö (LM-rev), Full Age Spectrum (FAS) and the Berlin Initiative Study 1 (BIS1). Pearson’s correlation and Bland-Altman plots (B&A) were performed. The accuracy were defined as the percentage of patients whose eGFR was within +30% of measured GFR.

Results: 146 patients were included (age 68 +13 years, LVEF <40 % n=53 (36 %)). Mean mGFR were 42 ml/min/1,73 m2 and mean eGFR for all equations were eGFR 30-59 ml/min/1,73m2 except for MDRD with a mean eGFR of 28 ml/min/1,73 m2 due to urea only available for patients with renal impairment. Pearson’s correlation coefficient (r) had the highest precision for MDRD (r=0.9), followed by LM-rev (r=0.88) and lowest for CGAW (r=0.81). B&A showed that MDRD had lowest bias (-4.8) followed by LM-rev (17.7). CGAW (29.8) and sMDRD (31.9) had highest bias. Accuracy were under 75% for all equations except MDRD (MDRD 80%, LM-rev 68%, CGIW 63%, BIS1 59%, CKD-EPI 58%, FAS 55%, CGAw 46%, sMDRD 46%).

Conclusions: LM-rev showed the lowest bias and highest precision and accuracy in estimating GFR in our population of patients with chronic heart failure. In patients with renal impairment and heart failure, MDRD was the most accurate method. The most common method, Cockroft-Gault, had the weakest correlation and overestimates renal function the most.
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