Less than 2 years experience winners:

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Title: Comparison of Calculated versus Urine Measured Creatinine Clearance in the Critically Ill

The Cockcroft-Gault equation (CG) has been validated for estimation of creatinine clearance (CrCl) in patients with stable renal function. Nonetheless, it is used in the intensive care unit (ICU) where acute kidney injury (AKI) is common.

Compared to measured CrCl from 24-hour urine collection (24-CrCl), the CG-CrCl overestimates renal function in patients with AKI.

A retrospective analysis of consecutive admissions to five ICUs at a tertiary care, referral center was conducted between 2006 and 2012. Patients with a 24-CrCl, daily serum creatinine and recorded daily urine output were included. AKI was defined using AKI Network (AKIN) and RIFLE classifications, and was assessed on ICU days prior to urine collection. Continuous variables were analyzed with the Wilcoxon Rank Sum test and the Mann-Whitney U test. The independent samples Kruskal-Wallis test was used to analyze the effect of AKI severity on the discrepancy between 24-CrCl and CG-CrCl.

Included patients (n=291) had a median age of 61 years and were 64% male, 47% white, and 48% admitted to coronary care unit. CG-CrCl overestimated 24-CrCl by a median 9.3 ml/min (61.3 [IQR 38.8 to 90.4] vs. 52 [IQR 27 to 85], P < 0.001). Per AKIN criteria, 165 (57%) patients had AKI as either stage 1 (n=50, 17%), stage 2 (n=60, 21%), or stage 3 (n=55, 19%). The CG-CrCl overestimated 24-CrCl in patients with AKI per AKIN criteria, which increased with severity (ml/min; stage 0=3.8 [IQR -11.1 to 24.7], stage 1=3.0 [IQR 2.5 to 12.8], stage 2=6.4 [IQR -4.2 to 25.6], and stage 3=12.7 [IQR 0.5 to 28.8], P=0.037). Per RIFLE criteria, 147 (51%) patients had AKI classified as either Risk (n=29, 10%), Injury (n=65, 22%), or Failure (n=53, 18%). The CG-CrCl overestimated 24-CrCl in patients with AKI per RIFLE criteria, which increased with severity (ml/min, normal=3.0 [IQR -10.7 to 20.3], Risk=5.9 [IQR -7.4 to 15.2], Injury=6.2 [IQR-3.4 to 25.5], Failure=14.5 [IQR 0.8 to 33.3], P=0.023).

The CG-CrCl overestimates 24-CrCl in patients with AKI, especially AKIN stage 3 and RIFLE Failure classification patients. Use of CG estimations should be used with caution in these patient populations.