

Category : **Renal: failure**

A51 - Utility of 8 hour urine creatinine clearance to guide dosing in critically ill patients: a single centre retrospective analysis

P Rajeevkumar¹ ; M Ostermann² ; F Hanks³

¹Guys´ and St Thomas´ NHS Foundation Trust, Pharmacy , London, United Kingdom, ²Guys´ and St Thomas´ NHS Foundation Trust, Department of Critical Care, London, United Kingdom, ³Guys´ and St Thomas´ NHS Foundation Trust, Critical Care Pharmacy , London, United Kingdom

Introduction:

Serum creatinine (SCr) is used to calculate Cockcroft-Gault Creatinine Clearance (C&G CrCl) to estimate Glomerular Filtration Rate (GFR) and guide drug dosing (1). However, SCr is reported to have low sensitivity for detecting renal dysfunction in critical illness. Population based equations such as C&G CrCl have not been validated in Acute Kidney Injury (AKI), secondary to induced pathophysiological changes. Direct measurement of CrCl is advocated such as 4-8hr Urine Creatinine Clearance (UrCrCl) (1). In this retrospective analysis we describe the variation in estimated GFR (eGFR) from results of C&G CrCl, CKD-EPI eGFR and measured UrCrCl.

Methods:

Retrospective data collection and case note review from electronic health records (Phillips ICCA® and iSOFT Clinical Manager®) was completed from Dec 2018 to Nov 2021, for adult critical care patients admitted to Guy’s and St Thomas’ Foundation Trust who had a measured UrCrCl. The aims were to compare results and to assess the impact on drug dosing.

Results:

In 28/31 (90.3%) patients, C&G CrCl was an over-estimation of renal function, with a median difference between C&G CrCl and measured UrCrCl of 239%. UrCrCl results triggered a change in drug dosing in 16/31 (51.6%) of patients. Drug dosing could have been optimised in a further 7/31 (22.6%) patients if the UrCrCl results had been noticed and acted upon within 24hrs (Table 1).

Conclusion:

UrCrCl provides a more accurate measure of GFR compared to C&G CrCl or eGFR and triggered a change in drug therapy in 52% of patients. UrCrCl is useful in patients in whom serum creatinine results may be confounded by extremes of age, frailty, low muscle mass and fluctuations in fluid balance. Thus, UrCrCl results serve to optimise drug dosing and limit risks of harm from both, toxicity and underdosing.

References:

1. Eric A. J. Hoste et al, Assessment of renal function in recently admitted critically ill patients with normal serum creatinine, *Nephrology Dialysis Transplantation*, Volume 20, Issue 4, April 2005, Pages 747–753

Table:

Patient characteristics (n=31)	Results
Median age	48 yrs
Median SCr [micromole/L]	56 (IQR 27-104.5)
Median C&G CrCl [ml/min]	109 (IQR 41 – 244)
Median eGFR [ml/min]	104 (IQR 52 – 236)
Median UrCrCl [ml/min]	39 (IQR 15-75)

Median % difference between C&G CrCl and UrCrCl	239% (IQR 134% - 415%)
UrCrCl result prompted change of drug therapy	51.6% (16/31)

Table 1: Results [Abbreviations: IQR, interquartile range]