

## Documents

Md Ralib, A., Ramly, N., Nanyan, S., Mat Nor, M.

**The utility of the creatinine excretion to production ratio and the plasma creatinine and cystatin C based kinetic estimates of glomerular filtration rates in critically ill patients with sepsis**  
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Department of Anaesthesiology and Critical Care, Kuliyah of Medicine, International Islamic University Malaysia, Kuantan, Pahang, 25200, Malaysia

### Abstract

Introduction: Creatinine kinetics denotes that under steady-state conditions, creatinine production (G) will equal creatinine excretion rate (E). The glomerular filtration (GFR) is impaired when excretion is less than production. The kinetic estimate of GFR (keGFR) and E/G ratio were proposed as a more accurate estimate of GFR in acute settings with rapidly changing kidney function. We evaluated keGFR and E/G to diagnose AKI, predict recovery, death or dialysis. Methods: This is a prospective observational study of critically ill patients. Inclusion criteria were patients >18 years old with sepsis, defined as clinical infection with an increase in SOFA score >2, and plasma procalcitonin >0.5 ng/mL. Plasma creatinine and Cystatin C were measured on ICU admission and 4 h later, and their keGFR was calculated. Urine creatinine and urine output were measured over 4 h to calculate the E/G ratio. Results: A total of 70 patients were recruited, of which 49 (70%) had AKI. Of these, 33 recovered within 3 days, and 15 had a composite outcome of death or dialysis. Day 1 keGFR Cr and keGFR CysC discriminated AKI from non-AKI with AUCs of 0.85 (95% Confidence interval: 0.74-0.96), and 0.86 (0.76-0.97), respectively. The E/G ratio predicted AKI recovery (AUC: 0.81 (0.69-0.97)). The keGFRs were not predictive of death or dialysis, whereas E/G was predictive (AUC: 0.76 (0.63-0.89)). Conclusion: keGFR was strongly diagnostic of AKI. The E/G ratio predicted AKI recovery and a composite outcome of death and dialysis. © 2022 Wolters Kluwer Medknow Publications. All rights reserved.

### Author Keywords

Creatinine; critical illness; Cystatin C; glomerular filtration rate; sepsis

### Index Keywords

biological marker, creatinine, cystatin C, kinetic estimated glomerular filtration rate, procalcitonin, unclassified drug; acute kidney failure, adult, area under the curve, Article, controlled study, creatinine blood level, creatinine clearance, creatinine urine level, critically ill patient, death, diagnostic test accuracy study, dialysis, estimated glomerular filtration rate, female, human, intensive care unit, kidney disease, major clinical study, male, observational study, polymerase chain reaction, predictive value, prospective study, sepsis, Sequential Organ Failure Assessment Score, urine volume

### Chemicals/CAS

creatinine, 19230-81-0, 60-27-5; procalcitonin, 56645-65-9

### Tradenames

Olympus AU2700, Olympus, United States

### Manufacturers

Olympus, United States

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**Correspondence Address**

Md Ralib A.; Department of Anaesthesiology and Critical Care, Kuantan, Malaysia; email: azrinar@iiium.edu.my

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