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Comparison of Estimated – Glomerular Filtration Rates Given by Different Serum Creatinine Based Equations among Patients with Chronic Kidney Disease Attending the Teaching Hospital, Kurunegala, Sri Lanka

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Abstract

Chronic Kidney Disease (CKD) is a health issue affecting nearly 13.4% of the global population and also a major burden on the health sector of Sri Lanka. The investigation of the estimated Glomerular Filtration Rates (eGFR) plays a vital role in disease diagnosis, CKD stage determination and patient management. Various equations have been developed for GFR estimation, but the CKD stage of a patient may vary based on the equation used. Therefore, this study was focused on comparing and identifying variations among eGFR values calculated using six serum creatinine based equations. A cross sectional and analytical study was conducted using 205 CKD patients attending the Nephrology clinic, Teaching Hospital, Kurunegala. An additional blood volume was collected for serum creatinine testing, during routine blood collection and analysis were performed at a registered laboratory in Colombo. The eGFR was calculated for every patient using five equations: 4 - variable - MDRD, Cockcroft Gault (CG), CKD - EPI, Full Age Spectrum (FAS) and Mayo Clinic Quadratic (MCQ). Berlin Initiative Study-1 (BIS-1) equation was additionally used for patients of age ≥ 70 years. Accordingly, the equations; CKD - EPI, FAS and MCQ showed statistically significant mean differences with the routinely used MDRD equation while it was not so between MDRD and CG equations. In patients of age ≥ 70, BIS - 1, CKD - EPI and CG equations showed significant mean differences with the MDRD equation, but it was not so in FAS and MCQ equations. Repeated measures ANOVA revealed that the GFR values of the same patient varied significantly (p < 0.001) among the five equations considered. This study provides evidence for deviations among equations in eGFR estimation and CKD stage determination. Therefore, it can be concluded that there is a necessity of modifying and adapting eGFR equations to suit our population.

Keywords: *Chronic Kidney Disease, eGFR, CG*