ID 731

Comparison of Gate's GFR in ^{99m}Tc-DTPA Scintigraphy and Creatinine-based Estimated Glomerular Filtration Rate (GFR) among Chronic Kidney Disease (CKD) Patients in Sri Lanka

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Chronic Kidney Disease (CKD) presents a growing health challenge globally with a notable increase in prevalence in Sri Lanka, particularly in the North Central and Uva Provinces. Accurate estimation of Glomerular Filtration Rate (GFR) is crucial for diagnosing and managing CKD, but the validity of existing methods within the Sri Lankan context requires further investigation. This study evaluates the correlation between the 99^{99m}Tc-DPTA scintigraphy method and the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) method for GFR estimation. The study was conducted retrospectively at Lanka Hospital, Colombo, from January 2021 to December 2023, focusing on CKD patients aged 18 and above. A total of 128 sample reports were selected from a database containing over 12,000 99^{99m}Tc-DPTA scintigraphy studies. The imaging was carried out using the Siemens E-Cam Dual Detector Single Photon Emission Computed Tomography (SPECT) gamma camera and the GFR was calculated by Gates algorithm. Bland-Altman analysis revealed substantial variability between the methods with a bias towards the Gates method. Weak negative correlation was observed between GFR deviation and age, while serum creatinine showed a positive correlation and gender showed no significant association. For individuals with GFR > 90 mL/min/1.73m^2, good concordance was noted. These findings highlight that while Gates method tends to produce higher GFR values, particularly in CKD patients, reliance solely on this method is not recommended. The study underscores the need for a comprehensive approach to GFR estimation to improve diagnostic accuracy and treatment efficacy in the Sri Lankan population.

Keywords: *chronic kidney disease, ^{99m}Tc-DTPA, chronic kidney disease epidemiology collaboration, glomerular filtration rate calculation, gates method*