SUMMARY

Background

Chronic kidney disease is a recognized public health problem. The National Kidney Foundation recommends the use of estimated Glomerular Filtration Rate (eGFR) as a universal method of assessing the renal function of patients in order to eliminate the cumbersomeness and inconvenience of collecting 24-hour urine for estimating creatinine clearance to patients. These creatinine based equations differ in many aspects and this may account for a wide range of variations reported between them globally. This study was designed to determine the clinical utility of both CG and MDRD equations in estimating the kidney function of patients at advanced stage of CKD.

Objectives

To determine the correlation of MDRD study and the Cockcroft-Gault equations with the creatinine clearance (CrCl) determined by 24 hour urine collection and the influence of anthropometric indices on the predictive accuracy of Cockcroft-Gault equation.

Patients and Methods

The study was a cross sectional study of patients with advanced chronic kidney disease carried out at the university of Ilorin teaching hospital (UIITH). Fifty seven patients with stages 3 and 4 CKD and 57 healthy age and sex matched controls were studied. Relevant clinical history was obtained and physical examination carried out. Blood sample was taken for serum creatinine and this was used to calculate the eGFR using Cockcroft Gault equation with both measured and lean body weights and the 4 variable MDRD equation.
Results

The mean age of the patients was 44.11±12.71 years with a male to female ratio of 1.1:1. All the 3 equations had a good correlation with the creatinine clearance. Cockcroft-Gault equation using lean body weight (CGLBW) had the best correlation (r=0.724, p<0.001) followed by CGABW and MDRD (r=0.674, p<0.001). CGLBW also had the best percentage precision for its eGFR with 78.9 % and 54.4% within 30% and 20% of the creatinine clearance. There was statistically significant difference between the two estimates of Cockcroft-Gault with patients in CKD 3 and CKD 4. There was also statistically significant difference between CGABW and Creatinine clearance in patients in CKD stage 4.

Conclusions

The Cockcroft-Gault equation using the lean body weight is superior to the MDRD and the CGABW in terms of precision, bias and agreement in estimating GFR in advanced stage of CKD. The CGLBW due to the tendency to under estimate the creatinine clearance in advanced chronic kidney disease encourages a more aggressive care in advanced CKD. Using the lean body weight and adjusting for body surface area improves accuracy of the original Cockcroft-Gault equation and may be more appropriate in patients with advanced chronic kidney disease.