CHRONIC KIDNEY DISEASE. LAB METHODS, GFR MEASUREMENT, URINE PROTEOMICS

FP250 ASSESSING THE VALIDITY OF DIFFERENT PREDICTION EQUATIONS FOR ESTIMATING GLOMERULAR FILTRATION RATE AMONG HEALTHY ADULT BANGLADESHI POPULATION

Palash Mitra1, Wasim Mohammad Mohosinul Haque1, Muhammad Abdur Rahim1, Tasrina Shamnaz Samdani2, Sarwar Iqbal1 and Mohammad Abul Mansur1
1BIRDEM General Hospital, Nephrology, Dhaka, Bangladesh, 2Dhaka Medical College & Hospital, Medicine, Dhaka, Bangladesh

Introduction and Aims: Glomerular filtration rate (GFR) is widely accepted as the best index of renal function, in health and disease. It can be measured by various complicated and costly procedures or can also be estimated by various proposed GFR estimating equations. Most of these equations derived from Caucasians suffering from different stages of chronic kidney disease. The aim of this study was to assess the validity of these equations on healthy adult Bangladeshi population.

Methods: The study was conducted in the transplant unit of a tertiary care hospital of Bangladesh among 54 consecutive healthy kidney donors. Estimated GFR (eGFR) by Cockcroft-Gault (CG), Modification of Diet in Renal Disease (MDRD) and Chronic Kidney Disease Epidemiology (CKD-EPI) formula were compared against measured GFR (mGFR) by Tc-99m diethylenetriamine pentaacetic acid (DTPA) renogram.

Results: Mean age of the study population was 37.2 ± 10.4 years with equal numbers of male and female participant. The mean and median mGFR by Tc-99m DTPA was 99.54 ± 19.06 and 99.67 ml/min/1.73 m2 respectively. The mean and median difference between mGFR and eGFR was -12.37 and -19.39 ml/min/1.73 m2 for CG, -5.8 and -6.47 ml/min/1.73 m2 for MDRD and -1.76 and 0.33 ml/min/1.73 m2 for CKD-EPI formula respectively. The standard deviation of mean bias was 22.91, 23.39 and 23.19 for CG, MDRD and CKD-EPI respectively. The accuracy within 10% was 50%, 51.9%, 55.6% and within 30% was 29.6%, 40.7%, 42.6% for CG, MDRD and CKD-EPI respectively. Estimated GFR of CKD-EPI showed overall highest precision among three equations. But in 37 subjects with normal renal function (mGFR ≥ 90 mL/min/1.73 m2) CKD-EPI equation of eGFR significantly (p-Value 0.007) underestimated mGFR and in 17 subjects with decreased renal function (mGFR ≤ 90 mL/min/1.73m2) it significantly (p-Value 0.006) overestimated mGFR.

Conclusions: Though the results from the healthy Bangladeshi kidney donors suggests that the overall eGFR of CKD-EPI equation was relatively more accurate among the three but it has a tendency to underestimate normal renal function and overestimate decreased renal function which may influence erroneously a vital decision or give a false impression about a person’s renal function status. So, like the other two, CKD-EPI equation is also sub-optimal for clinical use in this region and this situation warrants adaptive correction of the equation for this region or developing a newer predictive equation for estimating GFR.

© The Author 2015. Published by Oxford University Press on behalf of ERA-EDTA. All rights reserved.