ACCOUNTING FOR INDIVIDUAL BODY SURFACE AREA DOES IMPROVE ESTIMATION OF ABSOLUTE GFR USING THE CKD-EPI EQUATION

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Introduction
We compared estimated glomerular filtration rate (eGFR) according to the CKD-EPI equation, with (CKD-EPI, mL/min/1.73m²) and without body surface area (BSA)-normalisation (CKD-EPI_BSA, mL/min), against measured Tc-DTPA GFR (mL/min) in 222 individuals, including 80 with malignancy.

Methods
BSA was calculated for each individual using the Du Bois equation. The CKD-EPI, and CKD-EPI_BSA equations were compared with measured Tc-DTPA GFR with respect to bias, proportion within 30% of GFR (P30) and area under the receiver-operator curve (ROC) for detecting various levels of GFR, and in the 80 oncology patients, concordance in relation to carboplatin dosing.

Results
The mean (SD) BSA and GFR for the entire group was 1.99 (0.25) m² and 127 (41) mL/min, respectively. Less underestimation of GFR was observed using CKD-EPI_BSA. The P30 for Tc-DTPA GFR was significantly higher with the CKD-EPI_BSA (80%) than with the CKD-EPI equation (63%, P=0.0001). Large improvements in P30s was achieved by the CKD-EPI_BSA especially in those with BMI >30 kg/m² (74.4% vs. 42.3% by the CKD-EPI). The ROC area under curve (AUC) for CKD-EPI_BSA equation to detect GFR <90 mL/min (0.85) and >125 mL/min (0.81) was greater than that for the CKD-EPI equation (0.80 and 0.71, respectively). Concordance for carboplatin dosing according to Tc-DTPA GFR using the CKD-EPI_BSA equation was 71% and 56% by the CKD-EPI equation (P=0.07).

Conclusion
The estimation of absolute Tc-DTPA GFR by using the CKD-EPI equation was improved by the removal of BSA normalisation. This was reflected by higher proportion of results within 30% of GFR and less underestimations of GFR.