Abstract N°1

**Accuracy of Cockcroft&Gault and CKD-EPI equations to estimate glomerular filtration rate in obese population.**

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Introduction:

The prevalence of obesity is dramatically rising worldwide. When drug dosing is considered, KDIGO recommends using estimated glomerular filtration rate (eGFR), which is not adjusted to the body surface area (BSA). We have tested the performances of two creatinine-based equations: Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) “de-indexed” by BSA, and Cockcroft&Gault (CG) equation (non-indexed by BSA) with actual body weight or adjusted ideal body weight (AIBW). We test the performance of these equations by comparing them with measured GFR (mGFR) also expressed in mL/min.

Methods:   
Patients with body mass index (BMI) higher than 30 kg/m² were included. The reference method for GFR measurement was plasma clearance of 51Cr-EDTA. We have “de-indexed” CKD-EPI, which is a BSA-adjusted value, by multiplying eGFR by each individual’s body surface area and by dividing this intermediate result by 1.73 m2 (CKD-EPIdeindexed). We calculated bias (defined as the mean difference between estimated and measured GFR), precision (defined as the SD around the bias) and accuracy 30% (defined as the percentage of estimations within ± 30% of measured GFR).

Results:   
The population included 366 patients (185 women) from two different areas. Mean age was 55 ± 14 years and mean BMI was 36 ± 7 kg/m2. Mean mGFR was 71 ± 35 mL/min. In the global population, bias of CG and CGAIBW was + 25 ± 39.8 mL/min and + 2.6 ± 21.7 mL/min, respectively. Accuracy 30% was 57% and 78%, respectively(p<0.05). For the CKD-EPIdeindexed equation, the bias was + 6.2 ± 19.7mL/min and the accuracy 30% was 76%.

Conclusion:

CG is actually the equation used for drug dosing adaptation. Its accuracy to estimate GFR is however not optimal in obese patients, as expected by the bias induced by the actual body weight in the equation. Using adjusted ideal body weight in CG avoids this inadequacy and significantly improves the performance of the CG. We demonstrated that CKD-EPIdeindexed had globally the same performance as the CGAIBW equation to estimate non-indexed mGFR.

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| **De-indexed mGFR**  **(mL/min)** | *CG* | *CGAIBW* | *CKD-EPI*  *deindexed* |
| *Bias* | 25.0 | 2.6 | 6.2 |
| *Precision* | 39.8 | 21.7 | 19.7 |
| *Accuracy 30%* | 57 | 78 | 76 |
| *Accuracy 15%* | 34 | 45 | 46 |