

ACCURACY OF RENAL FUNCTION ESTIMATING FORMULAS COMPARED TO IOHEXOL CLEARANCE IN CRITICALLY ILL CHILDREN

Dhont Evelyn, Windels C., De Jaeger A., Van Der Heggen T., Vande Walle J., Croubets S., De Baere S., De Paepe P. and De Cock P.

Department of Paediatric Intensive Care, Ghent University Hospital

Aims: Accurate assessment of renal function is crucial in intensive care. Our aim was to evaluate the performance of GFR estimating formulas based on serum creatinine, cystatin C and betatrace protein in comparison with the gold standard measured plasma iohexol clearance (CLiohex) in critically ill children. **Methods :** 40 critically ill children were included. After injection of a iohexol bolus, 6 blood samples were taken over a 360- minutes interval. Measured CLiohex was compared with 10 Screat- based, 10 CysC-based and 2 BTP-based eGFR formulas and 3 eGFR formulas combining the above biomarkers. Correlation was described using Passing-Bablok regression analysis. Agreement was assessed by Bland-Altman plots. Accuracy was determined as the percentage of GFR estimates within $\pm 10\%$ and $\pm 30\%$ of measured GFR by CLiohex. P30 accuracy $>75\%$ is considered sufficient, ideally, P30 should be $>90\%$. Performance of eGFR formulas was also assessed separately in subgroups with CLiohex <100 ml/min/1.73m² and >100 ml/min/1.73m². **Results:** No adverse effects related to iohexol were observed. Median CLiohex was 121ml/min/1.73m². Only 5 eGFR formulas showed an overall P30 $>75\%$. None of the eGFR formulas reached a P30 $>90\%$ for the entire study population. Almost all eGFR formulas tended to overestimate true GFR. Formulas combining more than one biomarker outperformed formulas using only 1 biomarker. Combinations of 2 formulas showed a better performance with P30 $> 75\%$ for half of the relevant combinations. **Conclusion:** Commonly used eGFR formulas show low to moderate accuracy compared with GFR measured by CLiohex. Combining eGFR formulas yields a higher accuracy to estimate GFR. CLiohex is a safe alternative to accurately determine renal function in PICU patients.