

INTERFERENCE VERIFICATION OF THE ABL827 POINT-OF-CARE CREATININE METHOD COMPARED TO AUTOMATED CREATININE ASSAYS

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Background: Interferences with creatinine measurements may result in inaccurate estimations of the glomerular filtration rate, particularly in children and neonates, or result in inappropriate alerts for acute kidney injury. We investigated the impact of common interferences on a point of care and two automated creatinine methods.

Methods: Pooled serum samples at three creatinine concentrations, representative of different age groups, were spiked with HbA, HbF, unconjugated bilirubin, ditauobilirubin and Intralipid® to mimic common interferences, and measured in duplicates with Radiometer's ABL827 point of care blood gas analyser and with Roche's compensated, rate-blanked, kinetic Jaffe and enzymatic creatinine methods. Our interference criterion was $\pm 8\%$ recovery of unspiked samples, based on allowable limits of performance set by the external quality assurance program of the Royal College of Pathologists of Australasia. Interference indices obtained in our study were compared to that of recommended by manufacturers.

Results: The Radiometer ABL 827 creatinine method, used at the point-of-care, was not affected by any of the above interferences. The degree of HbA and HbF interference in the automated Jaffe and enzymatic methods depended on creatinine concentration. The manufacturer provided haemolysis index is only applicable when creatinine is >100 $\mu\text{mol/L}$. For creatinine <100 $\mu\text{mol/L}$, as commonly seen in neonates and children, our interference criterion was met at much lower indices. In the presence of HbF the Jaffe test is unsuitable for neonatal specimens and the Roche enzymatic assay also underestimates creatinine. Unconjugated bilirubin did not interfere up to 700 $\mu\text{mol/L}$ (Jaffe) and 300 $\mu\text{mol/L}$ (enzymatic). Conjugated bilirubin interfered up to 50 $\mu\text{mol/L}$ (Jaffe) and 200 $\mu\text{mol/L}$ (enzymatic), but the Roche instrumentation cannot differentiate between unconjugated and conjugated bilirubin when interference index measurements are taken. Creatinine method interferences by haemolysis and bilirubin, often seen in neonates, were found to be additive with the automated creatinine assays.

Conclusion: The Radiometer ABL 827 enzymatic creatinine method on point of care blood gas analysers is free from common interferences which makes it the best alternative for testing haemolysed, icteric or hyperlipidaemic specimens, which is particularly useful in paediatric and neonatal settings. In neonatal care the only limiting factor is the relatively high sample volume required for POC testing.