ABSTRACT

Background: In clinical practice, the measurement of serum or plasma creatinine plays a vital role in the early detection of chronic kidney disease and is recommended by the National Kidney Disease Education Program (NKDEP). Therefore, this study was designed to investigate the correlation between the whole blood creatinine sensor on the ABL800 FLEX (Radiometer America Inc.) and the Olympus plasma creatinine procedure (a kinetic modification of the Jaffe procedure).

Methods: 85 heparinized whole blood versus plasma samples were first analyzed in duplicate on the ABL800 FLEX analyzer. The whole blood was spun down and the plasma was analyzed (in duplicate) on the Olympus AU5431 auto-analyzer within sixty minutes of the whole blood evaluation. The plasma samples were then re-analyzed on the ABL800 FLEX analyzer. A comparison of both whole blood and converted plasma values from the ABL800 FLEX to the Olympus plasma concentration showed good correlation (r > 0.996). The slopes of the linear regressions were 0.97 with an intercept of 0.05. The bias between the whole blood-plasma algorithm and the Olympus plasma concentration was low at -0.22 mg/dL.

Conclusion: The results from this study clearly show that the ABL800 FLEX analyzer can be used to quickly and accurately measure creatinine in whole blood and plasma.

METHODS

Creatinine Testing Protocol: Venous heparinized whole blood samples were collected and measured in the following sequence:
1. Heparinized whole blood was analyzed in duplicate for creatinine on the ABL800 FLEX.
2. The whole blood was spun down and analyzed on the Olympus AU5431 analyzer for creatinine in duplicate within 60 minutes of the whole blood measurement on the ABL800 FLEX.
3. The plasma samples were then analyzed in duplicate on the ABL800 FLEX for creatinine.

Olympus Creatinine Assay: The Olympus creatinine procedure is a kinetic modification of the Jaffe procedure, in which creatinine reacts with picric acid at alkaline pH to form a yellow-orange complex.

ABL800 FLEX Creatinine Algorithm:

cCrea(corrected) = 0.950 × cCrea(measured) - 0.004

RESULTS

See figures 2-4 to right.

CONCLUSIONS

The ability to analyze creatinine in whole blood allows rapid and accurate measurements which are important in critical care settings. Whole blood analysis minimizes preanalytical errors resulting from transport, centrifugation, and separation of samples. The ABL800 FLEX analyzer was able to quickly and accurately measure creatinine in whole blood and plasma.

REFERENCES


ACKNOWLEDGEMENTS

Radiometer America Inc.