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Comparison of Umbilical Cord Whole Blood Lactate on Nova Biomedical StatStrip Lactate Meter with Gem Premier 4000 Blood Gas Analyzer and Abbott ARCHITECT ci16200 Laboratory Method

P. Talsma, G. Koerbin, H. Robins
Core Laboratory, ACT Pathology, The Canberra Hospital ACT 2606

Background and aim: An abnormal heartbeat detected by fetal heart monitoring may suggest inadequate oxygen delivery to the fetus. While base excess in cord blood has helped clinicians get a better grasp of the level of oxygen debt incurred during labor and delivery, this procedure is highly invasive and the specimen type is variable (umbilical cord venous versus arterial). Nevertheless, the acidosis suggested by the base excess may not reflect oxygen deprivation only, and is influenced also by bicarbonate therapy. Scalp pH has been used as an alternative to measuring base excess in umbilical cord blood and is thought to be less variable. However, the analysis of scalp pH is complicated, requires a relatively large amount of blood (30-50 µl), and sampling failure rates of 11-20% have been reported.

Lactate is a metabolite in anaerobic metabolism and reflects tissue hypoxia. Determination of lactate in blood from the fetus's scalp has been shown to have similar or better predictive properties compared with pH analysis in the identification of short term neonatal morbidity.

StatStrip Lactate (Nova Biomedical) is a handheld point-of-care meter intended for the measurement of whole blood lactate that provides results in13 seconds, enabling rapid identification of hyperlactemia or fetal hypoxia.

In this study we assessed the performance of StatStrip Lactate with the Gem Premier 4000 (Instrumentation Laboratory) blood gas analyser and the ARCHITECT ci16200 laboratory method (Abbott Diagnostics) on umbilical whole blood specimens.

Materials and methods: Whole blood umbilical cord samples were collected and tested within 5 minutes of parturition on StatStrip Lactate, Gem Premier 400, and Architect ci16200.

Results:

StatStrip Lactate vs. Gem Premier 4000	correlation coeffient 0.98, slope 0.95	intercept 0.12
StatStrip Lactate vs. ARCHITECT	correlation coeffient 0.97, slope 0.91	intercept 0.010
Gem Premier 4000 vs. ARCHITECT	correlation coeffient 0.98, slope 1.02	intercept 0.080

Conclusions: StatStrip Lactate results show good correlation with existing lactate methods used in the laboratory and is fit for intended use.