

Application of Nova StatStrip Blood Glucose Monitoring System for monitoring hypoglycemia in Newborns

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Objective:

Hypoglycemia can have serious consequences in newborn babies if not identified and managed early after birth. If not treated in a timely manner, the low glucose levels in the blood may have adverse effects on neonatal brain function and development. In our hospital hypoglycemia is considered at a glucose level of 2.5mmol/L and newborns are admitted to ICU for treatment when glucose levels are 2.0mmol/L or less. Currently new born babies defined with hypoglycemia are tested with ABL835 (Radiometer) blood gas analyzer. The primary objective of this study was to assess the performance of the StatStrip (Nova Biomedical) hospital whole blood glucose monitoring system (BGMS) for monitoring hypoglycemia in newborns.

Method

Heel-stick, heparinized whole blood was collected from 2682 newborn babies and routinely tested for glucose. For newborn babies with glucose values with glucose values 2,6 mmol/L or less additional testing was performed using StatStrip BGMS and the ABL 835 blood gas analyzer. For method comparison Passing-Bablok regression analysis was applied.

Result:

Using ABL 18.6% of newborns were defined as hypoglycemic and 7% had values of 2.0 mmol/L or less. Using StatStrip 22.2% of newborns were defined as hypoglycemic and 8.8% had values 2.0mmol/L or less. Passing bablok analysis of samples tested both by StatStrip and ABL (n=596): StatStrip: $y = x - 0.1$ $r = 0.82$. For glucose values < 2.6 mmol/L 97.3% of the comparative glucose values were different by < 0.83 mmol/L. There were 19 of the 596 glucose results > 0.83 mmol/L different. The StatStrip BGMS showed a slight negative bias with respect to the ABL 835 blood gas analyzer. Newborn babies would have had a different treatment based on StatStrip versus ABL if StatStrip was only applied.

Conclusion:

Our results show that the StatStrip correlates closely to ABL in the newborn hypoglycemic range. StatStrip identified more newborns as hypoglycemic and as such errs more on the safe-side compared to ABL. It has been reported that ABL glucose results can be affected by the presence of galactose and lactose which may be present in nutritional baby feeds. The influence of nutritional status on the pattern of results needs further evaluation.