Real-time continuous glucose monitoring in preterm infants (react): An International, open-label, randomised, controlled trial

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Continuous interstitial glucose monitoring (CGM) is used to assess glycaemic status in some adults and older children with diabetes.1,2 Additionally, CGM has been used in term, preterm and low birthweight newborns to evaluate glucose concentrations during the first days of life,3 to evaluate efficacy of dextrose gel in preventing hypoglycaemia,4 or to detect episodes of low glucose, which would go unrecognised with standard, intermittent blood sampling.3,4 CGM could potentially decrease the number of invasive capillary samplings.5

In the current study, the efficacy of CGM in maintaining glucose within a specified range was investigated. Overall, the intervention arm spent more time within the target range (94%) compared to the standard group (84%) or a total of 13 more hours. Although not statistically significant, more infants in the intervention group (15% vs. 12%) experienced at least one episode of hypoglycaemia (glucose = 2.2–2.6 mmol/L) with 13% in the intervention group versus 7% in the standard group having at least one episode of severe hypoglycaemia (glucose <2.2 mmol/L), consistent with previous studies showing that hypoglycaemic episodes might go unnoticed if relying solely on intermittent sampling. Alternatively, the different incidence of hypoglycaemia could be explained by higher rate of insulin use in the intervention arm (61%) compared to the standard group (37%) and a post hoc analysis of infants receiving insulin might have clarified this possibility. The intervention group had less continuous episodes longer than one hour with sensor glucose <2.6 mmol/L and less time in the hyperglycaemic range. The use of CGM was safe regarding episodes of infection or discomfort.

The protocol’s6 recommendation to start or increase the insulin dose when glucose levels reach 8 mmol/L might explain why more infants in the intervention arm received insulin in the first week of life compared with the standard group. The total dose of insulin was similar between groups, raising the possibility that infants in the intervention arm might have received insulin for transient elevated glucose levels. Different glucose thresholds and different durations of elevated levels before starting insulin might change the impact of CGM on insulin exposure.

One interesting exploratory finding was a higher incidence of NEC in the standard group, possibly due to more time spent in the hyperglycaemic range. This deserves further investigation.

The authors did not mention the proportion of growth restricted (IUGR) or small for gestational age infants. It is worth considering whether IUGR or other subgroups of infants with increased glycaemic variability in the first week of life (infants of diabetic mothers, congenital infections and HIE) would have demonstrated a different efficacy of CGM.

This study adds to the mounting evidence that CGM in preterms used to achieve glycaemic control is safe and efficacious. It extends the results from previous smaller studies to a larger, multicentre one. The optimal glucose concentration target range for preterms was not addressed. However, the results show that CGM can be used to improve future studies investigating different target glucose ranges in relationship to short- and long-term outcomes.
CONFLICT OF INTEREST
Dr. Rozance has received a StatStrip Glucose Meter from Nova Biomedical for use in his research laboratory.

URL TO THE FULL REVIEW ON THE EBNEO WEB
https://ebneo.org/preterm-continuous-glucose-monitoring

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