Published in final edited form as:

Evid Based Med. 2017 April ; 22(2): 62. doi:10.1136/ebmed-2016-110649.

Single dose of prophylactic oral dextrose gel reduces neonatal hypoglycaemia

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Context

Oral dextrose gel is a novel therapeutic option to manage asymptomatic neonatal hypoglycaemia. Previous studies^{1–3} have shown that the use of 40% buccal dextrose gel along with feeds reduces the need for intravenous dextrose therapy, promotes maternal infant bonding and reduces cost. The ease of administering the dextrose gel via the buccal mucosa² and improvement in breastfeeding rates have made this a popular therapy for hypoglycaemia and is currently being implemented in nurseries across the world. The incidence of hypoglycaemia is almost 50% in neonates with risk factors, including maternal diabetes, maternal β blocker therapy, large or small for gestational age and late-preterm infants. Hegarty *et al* went a step further with an aim to prevent hypoglycaemia in this high-risk population using various dosing regimens of dextrose gel.

Methods

Neonates 35 weeks' gestation at birth and at risk for hypoglycaemia were included in the study. Infants with a diagnosis of hypoglycaemia or admission to the neonatal intensive care unit (NICU) prior to intervention were excluded. The infants were randomised to receive either dextrose gel or placebo in following regimens: 200 mg/kg once, 400 mg/kg once, 200 mg/kg/dose for four doses, 400 mg/kg once followed by 200 mg/kg for three more doses for a total of 1000 mg/kg. Blood glucose concentration was first measured 2 hours after birth and subsequently every 2–4 hours for at least the first 12 hours and until there were three normal blood glucose levels. The primary outcome of the study was prevention of hypoglycaemia and secondary outcomes were admission to NICU, admission for hypoglycaemia and breast feeding at discharge. The entire team of investigators and family members were blinded. An intention-to-treat analysis was performed.

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Competing interests None declared.

Provenance and peer review Commissioned; internally peer reviewed.

Findings

The incidence of hypoglycaemia was low in babies who prophylactically received a single dose of 200 mg/kg dextrose gel (relative risk (RR) 0.68; 95% CI 0.47 to 0.99). Infants who received any dose of dextrose gel were less likely to develop hypoglycaemia (RR 0.79; 95% CI 0.64 to 0.98). The number needed to treat was 10 with 95% CI 5 to 115. There was no difference in the rate of NICU admission among groups treated with different doses of dextrose gel. Breastfeeding rates were not different. No adverse events were reported.

Commentary

This study was designed as a dose-finding trial to prevent hypoglycaemia in high-risk infants. The authors intend to select 0.5 mL/kg as the dose to be used in their ongoing trial of dextrose gel prophylaxis (Hypoglycaemia Prevention with Oral Dextrose—hPOD). Since diabetic mothers were approached more often for consent, infants of diabetic mothers (IDM) accounted for 75% of enrolled subjects - a fact that authors acknowledge as a limitation. The study did not find a difference in preventing neonatal hypoglycaemia between different doses and administering a single dose was easier. The incidence of hypoglycaemia in IDM⁴ has been reported to be ~50% which may be increased if multiple other risk factors are present. Absolute risk reduction for hypoglycaemia for any dose of dextrose gel compared with placebo was 18%. Although, this result should be interpreted with caution as the placebo group was pooled and the risk factors were skewed. The trial was not powered to see a difference in preventing hypoglycaemia based on risk factors, but prevention of hypoglycaemia makes this a potential therapy that needs to be investigated further through the hPOD trial. No adverse events such as hyperglycaemia were reported with either prophylactic or therapeutic use of dextrose gel which is an advantage compared with continuous dextrose therapy. Further investigations into cost-effectiveness of this prophylactic regimen and long-term neurodevelopmental outcome (2-year and school age) are required before widespread implementation of this practice.

Implications for practice

The use of dextrose gel to prevent hypoglycaemia among high-risk neonates is a novel approach that requires further investigation. The authors have acknowledged that this trial was a prelude to an ongoing trial using dextrose gel to prevent hypoglycaemia that studies its impact on NICU admissions and outcomes. The results of this 'hypoglycaemia prevention with oral dextrose (hPOD)' which will use 0.5 mL/kg of 40% dextrose gel may give us further insight into this potentially useful therapy.

Acknowledgments

Funding National Institute of Child Health and Human Development (HD072929).

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