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The effectiveness of oral dextrose gel for the treatment of neonatal hypoglycaemia remains unclear

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Context

Neonatal hypoglycaemia is a common problem and a preventable cause of neurological injury.¹ Forty per cent oral dextrose gel is a novel therapy and is being increasingly used for the treatment of neonatal hypoglycaemia. A systemic review by Weston *et al* aimed to evaluate the available evidence on the effectiveness of dextrose gel in correcting hypoglycaemia and its impact on neurodevelopment outcomes.

Methods

A Cochrane systematic review was conducted to evaluate the evidence for the oral dextrose gel therapy. The authors included randomised and quasi-randomised studies comparing dextrose gel therapy to placebo, no therapy or other treatments for neonatal hypoglycaemia. The search was conducted on MEDLINE, EMBASE, the Central Register of Controlled Trials, the Cumulative Index to Nursing and Allied Health Literature, Web of Science from the inception of the database to 29 February 2016. Also, relevant scientific meetings—American Academy of Pediatrics (2000 to 2014), European Society for Pediatric Research (2006 to 2015), Perinatal Society of Australia and New Zealand (2002 to 2015) were searched. Grading of Recommendations, Assessment, Development and Evaluation working group approach was used to assess the quality of the evidence. Studies which did not meet the above criteria or if the infants received intravenous dextrose before the intervention were excluded.

Findings

Two studies involving 312 infants were included in the review. Dextrose gel compared with placebo or no therapy did not alter the need for intravenous dextrose for the management of neonatal hypoglycaemia (risk ratio (RR) 0.78, 95% CI 0.46 to 1.32; two trials, 312 infants; very low quality evidence). There was no evidence for a difference in major neurosensory disability at 2 years of age (RR 6.27, 95% CI 0.77 to 51.03; one trial, n=184; very low quality of evidence). However, infants treated with dextrose gel had less separation from

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mothers (RR 0.54, 95% CI 0.31 to 0.93; one trial, 237 infants; moderate quality of evidence) and were more likely to be exclusively breast fed after discharge (RR 1.10, 95% CI 1.01 to 1.18; one trial, 237 infants; moderate quality of evidence).

Commentary

Oral dextrose gel is a popular therapy for neonatal hypoglycaemia.^{2, 3} This systemic review by Weston *et al* addresses the available evidence about oral dextrose gel therapy for managing neonatal hypoglycaemia. Ideally, a meta-analysis that includes large randomised control trials (RCTs) with minimal heterogeneity would address the issues raised in this study. Unfortunately, there are not enough RCTs like the dextrose gel for neonatal hypoglycaemia (the Sugar Babies Study) conducted by Harris *et al*.⁴ In addition, a study undertaken by Troughton *et al* that included 75 infants which used 400 mg/kg of 40% dextrose gel did not find a beneficial effect on recovery from hypoglycaemia at 15 min and 30 min.⁵ However, the higher dose of dextrose may have played a role in reducing the volume of the next oral feed in this trial compared with a placebo (7.6±1 mL/kg vs 13.1±1.1 mL/kg). The larger study undertaken by Harris *et al* found that the treatment with 200 mg/kg of 40% dextrose gel was more effective than feeding alone for reversal of neonatal hypoglycaemia in at-risk infants 35 weeks gestation in the first 48 hours after birth.⁴ A quality improvement project and a retrospective study found that dextrose gel reduced admissions to neonatal intensive care unit, improved breastfeeding rates and reduced the need for intravenous dextrose therapy.^{2, 3} The small number of studies included in this systemic review along with limited information from one of the included studies makes an assessment of bias difficult as acknowledged by the authors. The heterogeneity between the studies makes the interpretation of this systemic review difficult. Weston *et al* conclude that use of dextrose gel compared with placebo for the treatment of neonatal hypoglycaemia improved maternal-infant bonding and improved the rate of exclusive breast feeding after discharge, without altering the rate of developmental impairment at 2 years. The evidence for this conclusion was mostly derived from a single study, which is a limitation of this review.

Additional well designed RCTs to evaluate the effectiveness of dextrose gel for treating neonatal hypoglycaemia and neurodevelopment outcomes are necessary before making definitive conclusions on this topic.

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Implications for practice and research

- ▶ The effectiveness of oral dextrose gel in correcting neonatal hypoglycaemia and therefore in reducing long-term neurodevelopmental impairment, remains unclear.
- ▶ Use of 40% oral dextrose gel for the treatment of neonatal hypoglycaemia improved maternal-infant bonding during the hospital stay and increased exclusive breast feeding after discharge.
- ▶ More evidence about use of dextrose gel for the correction of neonatal hypoglycaemia and its impact on neurodevelopmental outcomes is required.