



# PROGENY

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## Dextrose Gel for Treatment of Neonatal Hypoglycemia

Neonatal hypoglycemia affects as many as 5-15% of otherwise healthy newborns, and it can be associated with poor neurodevelopmental outcome if not promptly diagnosed and adequately treated.<sup>1,2</sup> Treatment choices vary depending on the gestational age of the infant, birthweight and risk factors for hypoglycemia. For term and late preterm infants, initial management focuses on feeding and increased monitoring of blood glucose concentrations.<sup>3</sup> When feeding alone is not effective in raising the blood glucose level, newborns are often admitted to newborn intensive care units or special care nurseries for treatment with intravenous glucose. Such admissions usually require separation of mother and baby which can delay the establishment of breastfeeding.

The administration of oral carbohydrate is a first-line treatment for diabetic adults and children with low blood glucose concentrations.<sup>4</sup> And, sublingual glucose has been shown to be an effective treatment for hypoglycemic children with malaria.<sup>5</sup> Oral glucose treatment for newborns with hypoglycemia has not been well studied, and the role of dextrose gel in particular has been unclear. Two small observational studies of infants between 28 and 42 weeks' gestation have reported improvement in blood glucose levels after massaging dextrose gel (200 mg/kg) into the buccal mucosa. However, in one randomized trial of 75 hypoglycemic infants, investigators found no benefit to buccal administration of a 40% dextrose gel (400 mg/kg) plus feeding compared to feeding alone on the first day after birth.<sup>6</sup>

### The Sugar Babies Study

In September 2013, Harris et al published the Sugar Babies Study, a randomized, double-blind, placebo-controlled study conducted in New Zealand.<sup>7</sup> Their aim was to assess whether treatment with dextrose gel combined with feeding was more effective than feeding alone for reversal of neonatal hypoglycemia in at-risk newborns. Eligible babies were  $\geq 35$  weeks' gestation,  $\leq 48$  hours old and had risk factors for hypoglycemia (late preterm, IDM, SGA, LGA, poor feeding). Of 514 babies enrolled in the study, 237 became hypoglycemic and were assigned to one of two treatment groups: 118 (50%) received a feeding plus 40% dextrose gel and 119 (50%) received a feeding plus

placebo gel. Demographic and baseline characteristics were similar in both groups; however, more boys were allocated to the placebo group. The study gel (dextrose or placebo) was administered by massaging 0.5 mL/kg of gel into the baby’s buccal mucosa after the inside of his mouth was dried with gauze. Then the baby was encouraged to feed. If feeding was poor, expressed breastmilk or formula was given by syringe, according to the mother’s wishes. Blood glucose concentrations were measured 30 minutes after feeding. The primary outcome was treatment failure, defined as a blood glucose concentration of <2.6 mmol/L (46.8 mg/dL) obtained 30 minutes after the second of two doses of gel, two treatment attempts.

Findings in this study indicate that treatment with 40% dextrose gel along with feeding is more effective than feeding alone for reversal of neonatal hypoglycemia in at-risk term and late preterm babies in the first 48 hours after birth. Dextrose gel reduced the frequency of treatment failure compared with placebo (14% vs. 24%,  $p = .04$ ). Infants who received dextrose gel were less likely to be admitted to the NICU for management of hypoglycemia. They were less likely to receive formula feeds or additional dextrose (IV or open-label gel). And, with less clinical intervention babies spent less time separated from their parents. The authors suggested that all of these factors may have contributed to one additional finding: at 2 weeks of age, formula feeding was less common in babies who received dextrose gel than in those who received the placebo. There were no adverse effects on breastfeeding and rebound hypoglycemia was uncommon, occurring with similar frequency in both groups. Babies tolerated the administration of dextrose gel; parents and staff reported that it was easy to apply. Dextrose gel is relatively inexpensive and can be purchased commercially.

**Current Guideline from University of Iowa Children’s Hospital:  
Dextrose Gel in the Newborn Nursery**

*Procedure:*

- LIP will enter orders for glucose protocol upon admission.
- 40% Dextrose Gel (Glucose 15) will be automatically entered into the MAR as a PRN medication.
- Dose of 40% Dextrose Gel: 0.5 mL/kg with the patient’s weight rounded to the nearest kilogram.

Weight	Dose
2 kg	1.0 mL
3 kg	1.5 mL
4 kg	2.0 mL
5 kg	2.5 mL

- Infants will be managed according to the updated Hypoglycemia Algorithm.<sup>8</sup>
- If glucose level is low (25-44 mg/dL) and the infant is able to orally feed, 40% Dextrose Gel should be given first:
  - Obtain medication cup and oral syringe.
  - Scan Dextrose Gel into MAR.
  - Squeeze gel into the cup and draw up slowly with oral syringe.
  - There will be small bubbles suspended in the thick gel; if there are large bubbles, squirt gel back into cup and draw up again.

- Apply 0.5 ml of gel to (gloved) finger and massage into infant's cheek; repeat procedure in other cheek; continue alternating until entire dose is administered.
- Discard used tube of Dextrose Gel (single use only).
- Allow baby to breastfeed if hasn't fed within the last hour OR feed donor breastmilk or stock formula, 15-20 mL.
- Obtain follow-up blood glucose level 20-30 minutes after feeding.
- If glucose level remains low, repeat dose of Dextrose Gel and supplement baby with expressed/donor breastmilk or stock formula.
- Infant may receive up to 2 doses of Dextrose Gel.
- Obtain follow-up blood glucose level 20-30 minutes after feeding.
- If glucose level  $\geq 45$  mg/dL, continue frequent feedings and routine blood glucose screening.
- If glucose level remains low, obtain IV access and administer D10W bolus 2 mL/kg.
- Follow-up with LIP.



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