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[Intervention Review]

Cup feeding versus other forms of supplemental enteral feeding for newborn infants unable to fully breastfeed

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ABSTRACT

Background

Breast milk provides optimal nutrition for term and preterm infants, and the ideal way for infants to receive breast milk is through suckling at the breast. Unfortunately, this may not always be possible for medical or physiological reasons such as being born sick or preterm and as a result requiring supplemental feeding. Currently, there are various ways in which infants can receive supplemental feeds. Traditionally in neonatal and maternity units, bottles and nasogastric tubes have been used; however, cup feeding is becoming increasingly popular as a means of offering supplemental feeds in an attempt to improve breastfeeding rates. There is no consistency to guide the choice of method for supplemental feeding.

Objectives

To determine the effects of cup feeding versus other forms of supplemental enteral feeding on weight gain and achievement of successful breastfeeding in term and preterm infants who are unable to fully breastfeed.

Search methods

We used the standard search strategy of the Cochrane Neonatal Review group to search the Cochrane Central Register of Controlled Trials (CENTRAL 2016, Issue 1), MEDLINE via PubMed (1966 to 31 January 2016), Embase (1980 to 31 January 2016), and CINAHL (1982 to 31 January 2016). We also searched clinical trials' databases, conference proceedings, and the reference lists of retrieved articles for randomised controlled trials and quasi-randomised trials.

Selection criteria

Randomised or quasi-randomised controlled trials comparing cup feeding to other forms of enteral feeding for the supplementation of term and preterm infants.

Data collection and analysis

Data collection and analysis was performed in accordance with the methods of Cochrane Neonatal. We used the GRADE approach to assess the quality of evidence.

The review authors independently conducted quality assessments and data extraction for included trials. Outcomes reported from these studies were: weight gain; proportion not breastfeeding at hospital discharge; proportion not feeding at three months of age; proportion not feeding at six months of age; proportion not fully feeding at hospital discharge; proportion not fully breastfeeding at three months of age; proportion not fully breastfeeding at six months of age; average time per feed (minutes); length of stay; and physiological events of instability such as bradycardia, apnoea, and low oxygen saturation. For continuous variables such as weight gain, mean differences and 95% confidence intervals (CIs) were reported. For categorical outcomes such as mortality, the relative risks (RR) and 95% CIs were reported.

Main results

The experimental intervention was cup feeding and the control intervention was bottle feeding in all five studies included in this review. One study reported weight gain as g/kg/day and there was no statistically significant difference between the two groups (MD -0.60 , 95% CI -3.21 to 2.01); while a second study reported weight gain in the first seven days as grams/day and also showed no statistically significant difference between the two groups (MD -0.10 , 95% CI -0.36 to 0.16). There was substantial variation in results for the majority of breastfeeding outcomes, except for not breastfeeding at three months (three studies) (typical RR 0.83 , 95% CI 0.71 to 0.97) which favoured cup feeding. Where there was moderate heterogeneity meta-analysis was performed: not breastfeeding at six months (two studies) (typical RR 0.83 , 95% CI 0.72 to 0.95); not fully breastfeeding at hospital discharge (four studies) (typical RR 0.61 , 95% CI 0.52 to 0.71).

Two studies reported average time to feed which showed no difference between the two groups. Two studies assessed length of hospital stay and there was considerable variation in results and in the direction of effect. Only one study has reported gestational age at discharge, which showed no difference between the two groups (MD -0.10 , 95% CI -0.54 to 0.34).

Authors' conclusions

As the majority of infants in the included studies are preterm infants, no recommendations can be made for cup feeding term infants due to the lack of evidence in this population.

From the studies of preterm infants, cup feeding may have some benefits for late preterm infants and on breastfeeding rates up to six months of age. Self-reported breastfeeding status and compliance to supplemental interventions may over-report exclusivity and compliance, as societal expectations of breastfeeding and not wishing to disappoint healthcare professionals may influence responses at interview and on questionnaires.

The results for length of stay are mixed, with the study involving lower gestational age preterm infants finding that those fed by cup spent approximately 10 days longer in hospital, whereas the study involving preterm infants at a higher gestational age, who did not commence cup feeding until 35 weeks' gestation, did not have a longer length of stay, with both groups staying on average 26 days. This finding may have been influenced by gestational age at birth and gestational age at commencement of cup feeding, and their mothers' visits; (a large number of mothers of these late preterm infants lived regionally from the hospital and could visit at least twice per week).

Compliance to the intervention of cup feeding remains a challenge. The two largest studies have both reported non-compliance, with one study analysing data by intention to treat and the other excluding those infants from the analysis. This may have influenced the findings of the trial. Non-compliance issues need consideration before further large randomised controlled trials are undertaken as this influences power of the study and therefore the statistical results. In addition larger studies with better-quality (especially blinded) outcome assessment with 100% follow-up are needed.

PLAIN LANGUAGE SUMMARY

Cup feeding versus other forms of supplemental enteral feeding for newborn infants unable to fully breastfeed

Review question:

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For both term and preterm infants we wanted to identify the best method for offering supplemental feeds and asked if cup feeding is a better way to supplementally feed rather than bottle feeding or feeding with a tube, when newborn infants are unable to fully breastfeed.

Background:

Most infants born at term or slightly preterm can fully breastfeed following birth. However for a number of reasons some term newborns and many preterm newborns may not be able to fully breastfeed and require supplemental feeding by alternative methods, such as a cup, syringe, bottle or feeding tube, until they are able to fully breastfeed.

Study characteristics:

Our search for eligible studies conducted on 31 January 2016 revealed five studies, all comparing cup and bottle feeding in newborn infants, which we were able to include in this review. These studies were conducted in neonatal and maternity units in hospitals in Australia, the United Kingdom, Brazil and Turkey. The mean gestational age of the infants in most of the studies were similar at the time of entry into the study. In four of the studies the intervention (cup or bottle) commenced from the time of enrolment into the study, when the infants first needed a supplemental feed and were as young as 30 weeks' gestation. In the study conducted in Turkey, supplemental feeding was not commenced on enrolment into the study and at the time of first supplemental feed but delayed until infants were at least 35 weeks of age.

Key results:

For some of the outcomes, the results of the different studies could not be combined. This included not breastfeeding at hospital discharge; not exclusively breastfeeding at three months and at six months; the average time taken for a feed; and the number of days spent in hospital. For each of these outcomes, the results from some studies favoured cup feeding, while the results from other studies favoured bottle feeding.

For some of the outcomes, the results of the different studies could be combined: there was no difference in weight gain or gestational age at discharge between those infants who received supplemental feeds by cup compared to bottle. However those infants who received supplemental feeds by cup were more likely to be exclusively breastfeeding at hospital discharge and were more likely to be receiving some breastfeeds at three and six months of age.

As the studies mostly included preterm infants and few term infants, no recommendations can be made for cup feeding term infants.

Quality of evidence:

The quality of evidence for weight gain, length of stay, not breastfeeding at hospital discharge and at six months of age and exclusively breastfeeding at hospital discharge and at six months of age is graded very low to low. In the studies included in this review, it is reported that many infants who were to receive supplemental feeds by cup received supplemental feeds by other means as either the parents or nurses did not like cup feeding.