Avoidance of bottles during the establishment of breast feeds in preterm infants

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Preterm infants who received supplemental feeds with the aid of a cup were more likely to be breastfeeding on discharge from hospital compared with those who received their supplemental feeds through a bottle. However, cup-feeding was associated with longer hospital stay and breastfeeding continuation rates were not significantly higher in cup-fed infants beyond discharge from hospital.

RHL Commentary by Dy Recidoro Z

1. INTRODUCTION

Breast milk is the milk of choice for infants as it provides exceptional benefits that are unmatched by other types of milk. However, breastfeeding alone also presents a challenge for mothers and their infants. With more and more women working outside the home, breastfeeding infants after the standard two months' maternity leave becomes an emotional and physical ordeal for mothers. The challenge includes maintaining the mother’s milk supply.

Feeding preterm infants poses an even greater challenge for mothers since such infants are usually admitted (without their mothers) to newborn intensive care units in hospitals. As preterm infants mature, they are fed milk by gavage tube, and sucking feeds are introduced as they mature further. Mothers of preterm infants are encouraged to breastfeed, but since they are not always available to provide oral feeds during infants’ hospital stay, other methods of feeding infants are employed. The transition from gavage tube or bottle-feeding to breastfeeding after hospital stay becomes the next challenge for mothers. The establishment of breastfeeding habit is complicated by the initial exposure of preterm infants to artificial nipples. One problem identified is “nipple confusion” – a phenomenon that refers to an “infant’s difficulty in achieving the correct configuration, latching technique and sucking pattern necessary for successful breastfeeding after bottle-feeding or exposure to an artificial nipple” (1). The infant’s refusal to breastfeed after exposure to bottle-feeding is often attributed to nipple confusion, although scientific data to support this claim are still lacking.

In the context of ensuring breastfeeding success in preterm infants after discharge from hospital, this Cochrane review (2) seeks (i) to determine the effect of avoidance of bottle-feeds during the establishment of breastfeeding on the likelihood of successful breastfeeding; and (ii) to determine whether alternatives to bottle-feeds are safe.
2. METHODS OF THE REVIEW

The review authors searched the Cochrane Central Register of Controlled Trials and identified trials that had used randomized or quasi-randomized subject allocation in studies comparing avoidance of bottles with the use of bottles in women who had chosen to breastfeed their preterm infants.

Standard methods of the Cochrane Collaboration and the Cochrane Neonatal Review Group were used to ascertain the methodological quality of the included trials: adequacy of sequence generation and allocation concealment, blinding of intervention and outcome measurement and completeness of follow-up. Two review authors assessed trial quality independently and extracted data and, when needed, contacted study authors for additional information. Meta-analysis was done using a fixed-effects model with heterogeneity being tested using the I2 test.

3. RESULTS OF THE REVIEW

The search resulted in the identification of five trials, all of which were included; four had investigated the use of cup and one the use of gavage tube. These trials had varied attributes: the study duration ranged from 3 months to 3 years, the sample size ranged from 14 to 303, and gestational age was used as a sample selection criterion in four trials and birth weight in one. Together, the five trials, conducted between 1996 and 2004, involved 543 preterm infants of 32–35 weeks of gestational age; one study involved infants with birth weights of 1000–2500 grams. The trials had explored ways to improve the establishment of breastfeeding among preterm infants by avoiding bottle-feeding during their hospital stay. Four trials had compared breastfeeding plus supplemental feeds by cup versus breastfeeding plus supplementary feeds by bottle; one trial had compared breastfeeding plus supplementary feeds by gavage tube versus breastfeeding plus supplemental feeds by bottle.

Four studies involving 455 infants reported on the outcome of 'no breastfeeding or partial breastfeeding' at the time of discharge from hospital. Meta-analysis of these studies showed a significant decrease in the risk of infants not breastfeeding or only partially breastfeeding in the group that involved breastfeeding plus supplementary feeding by means other than bottles [relative risk (RR) 0.63, 95% confidence interval (CI) 0.41–0.96]. However, there was substantial heterogeneity between the studies (I2 64%).

Since heterogeneity was most likely caused by one study that involved feeding by gavage tube, a subgroup analysis was done without that study. In that analysis (involving 371 infants in three studies), in the group that received breast feeds supplemented with cup-feeding (versus those that received breast feeds supplemented with bottle-feeding), the risk of no breastfeeding or partial breastfeeding was significantly reduced (RR 0.75; 95% CI 0.61–0.92; RR -0.14, 95% CI -0.24 to -0.04; number needed to treat 7, 95% CI 4–25) with no heterogeneity (I2 0%).

Two studies with 385 participants evaluated the duration of hospital stay. In the meta-analysis an increase in the duration of hospital stay was associated with breastfeeding plus avoidance of bottle-feeding [weighted mean difference (WMD) 6.6 days; 95% CI 2.9–11.4; I2 66%].

In the studies included in the review, a high rate of non-compliance was noted in the breastfeeding plus cup-feeding groups. This finding was observed more frequently in hospitals that had introduced cup-feeding for the first time specifically for the study than in those that had been practising cup-feeding for 3 years prior to the study. One study investigated reasons for introduction of bottle-feeding among infants who had been randomized to cup-feeding. It found that, among those fed with a bottle, in 44% of cases it was the mother's decision, in 33% of cases it was on the advice of a health-care worker, and in 12% of the cases the health-care staff had refused to cup-feed the infants.
4. DISCUSSION

4.1 APPLICABILITY OF THE RESULTS

This review suggests that among preterm infants avoidance of bottle-feeding, and use of cup-feeding instead, may be a viable option to supplementing breastfeeding, as evidenced by breastfeeding rates on discharge from hospital. High rates of non-compliance with cup-feeding were seen in the experimental groups (breast-feeds plus cup-feeds) particularly in hospitals that had introduced cup-feeding for the first time especially for the study. The non-compliance could have been due to lack of confidence in cup-feeding on the part of hospital staff.

The available evidence was obtained in developed countries, but it would be applicable in developing countries as well. In fact, despite the higher cost of bottle-feeding, even among preterm infants, the establishment of breastfeeding should continue to be strongly advocated in under-resourced settings. The use of cup-feeding as a supplement to breastfeeding during this transition phase (to breastfeeding) should be considered since it is beneficial to both the mother and her child and should be observed with care. Gavage tube feeding should be the method of choice only when the infant's condition is seen to affect the potential benefit of cup feeds, such as when the preterm infant has marked neurological deficit, is generally lethargic, and has poor gag reflex; such newborns are likely to aspirate the milk regardless of the oral feeding method used (3).

4.2. IMPLEMENTATION OF THE INTERVENTION

Early establishment of breastfeeding should always be the goal so that infants feel physiologically secure. Once breastfeeding is established, the infants can be sent home.

A national policy should be developed on alternative feeding approaches for preterm infants (e.g. cup-feeding) to help establish breastfeeding at discharge from hospital. This should be viewed as a strategy for enhancing the baby- and mother-friendly initiative. Health-care staff, including those in intensive care units, should be trained in the appropriate alternative infant feeding skills.

Application of the cup-feeding strategy as a supplement to breastfeeding among preterm infants can be made more acceptable by involving mothers in the feeding of infants. Whenever mothers are available to breastfeed their preterm infants in hospital, they should be trained to perform cup-feeding by observing health-care staff and, where appropriate, assist in cup-feeding other infants under the supervision of health-care staff. It would be beneficial to teach infant-feeding to other adult family members. Follow-up home visits should be made by community health workers to help mothers in breastfeeding their preterm infants.

4.3. IMPLICATIONS FOR RESEARCH

In the studies included in the review, cup-feeding conferred no significant benefit in terms of continued breastfeeding beyond discharge from hospital. Moreover, cup-feeding was associated with a longer stay in hospital. Also, pooled data were mainly from a study that included babies who had violated study protocol, resulting in a high proportion of non-compliance (2), which could have produced a biased result. In view of this finding, further studies are needed with better randomization and longer follow-up. Furthermore, emphasis should be placed on determining whether breastfeeding continues after discharge from hospital and on community-based interventions to support breastfeeding in preterm infants. Future studies should also look into the secondary outcomes of safety and satisfaction of alternatives to breastfeeding methods.

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