

## Brief Reports

# Cup Feeding: An Alternative to Bottle Feeding in a Neonatal Intensive Care Unit

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### Summary

Cup feeding has been suggested as an alternative to bottle feeding to help promote breastfeeding by avoiding nipple confusion. To demonstrate the possibility and utility of cup feeding, records of 59 preterm and low birthweight babies (born before 37 weeks' gestation) admitted to a neonatal intensive care unit (NICU) from May 1995 to April 1996 were analyzed. Feeding was initiated on cup if swallowing was present and cup feeding was possible as early as 29 weeks' gestational age with a birthweight of 900 g. In the case of five infants (38 per cent) in the gestational age group 28–30 weeks, 19 infants (52 per cent) in the 31–34 weeks' gestation group, and six (56 per cent) in the 35–37 weeks' gestation group, feeding could be commenced directly with a cup. Out of 59 infants, 33 infants (56 per cent) could be discharged on exclusive breastfeeding. It was concluded that cup feeding is a useful alternative to bottle feeding and an effective method of feeding preterm and small infants in NICU. Cup feeding allows successful breastfeeding without causing 'nipple confusion'.

### Introduction

Breastmilk is the best food for newborns and they need nothing else until they are about 6 months old. However, not all newborns can suckle, especially those who are very small or sick. Alternative methods such as tube feeding, bottle feeding, and spoon or cup feeding are required until they are strong or mature enough to suckle effectively. Although these alternative methods of infant feeding have existed since prehistoric times, only feeding with a bottle appears to have become established and other feeding methods have been overlooked. Cup feeding receives little mention in medical literature, although it is one of the recommended methods of feeding in the training manuals for lactation management of the Baby Friendly Hospital Initiative and Breastfeeding Promotion Network of India.<sup>1,2</sup> In developing countries it is a method used by the staff of paediatric and special care baby units<sup>3–5</sup> to provide a safe method of feeding low birthweight babies until they are strong or mature enough to be put to the breast. Cup feeding helps in preventing nipple confusion and thus allows successful breastfeeding to be established, while bottle feeding increases the chances of lactation failure.

The present study was carried out to demonstrate the feasibility of cup feeding in low birthweight and preterm babies in the neonatal intensive care unit.

### Patients and Methods

In the present study a total of 59 newborns were studied who were admitted to the nursery from May 1995 to May 1996. Infants born above 37 weeks' gestational age were excluded. These infants were preterm or low birthweight. Gestational age was assessed by standard methods.

Cup feeding was defined as a method of feeding expressed breastmilk to an infant from a small steel cup without a spoon. The baby was held in an upright sitting position or comfortably on the lap. The cup was at least half-filled with milk. It was offered to the infant such that the rim of the cup was directed towards the lip and gums and resting gently on the lower lip with the milk line touching the baby's upper lip. The cup was then left in this position and the baby allowed to take as much as needed by licking. The initial feeds were in small quantities of 3–5 ml in each feed in the case of very low birthweight infants, which was gradually increased to the amount required for each feed and finally to as much as the baby could take. The cup was sterilized in a boiler, dried and re-used.

### Results

The 59 cases in the study were divided into three groups according to gestational age:

- Group I: Babies born with gestational age between 28 and 30 weeks.
- Group II: Babies with gestational age between 31 and 34 weeks.

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TABLE 1  
Group-wise distribution of cases

	Group I (28–30 weeks on admission)	Group II (31–34 weeks on admission)	Group III (35–37 weeks on admission)
Cases	11	37	11
Weight	900 g–1.65 kg	1.35 kg–2.2 kg	1.75 kg–2.3 kg
No. initially tube feed	8	15	2
No. on direct cup feeds	5	19	6
Baby's age at first cup feed in days (mean)	7–36 (12)	2–23 (7)	2–6 (3)
Gestational age at first cup feed in weeks	29–33.1	31.2–36	35.1–37
Total days of cup feeds in hospital (mean)	6–30 (13)	1–7 (3)	5–6 (5)
No. discharged on cup feeds only	4	1	0
No. discharged on cup feeds and breastfeeding	4	14	2

- Group III: Infants with gestational age between 35 and 37 weeks.

Table 1 shows the total number of cases in each group, with their average gestational ages, and the number of cases started initially with tube feeds or directly on cup feeds. It also shows the age at which cup feeding was possible for that group and the number of cases discharged directly on cup feeds or on exclusive breastfeeding.

#### Group I (28–30 weeks)

Earliest cup feeding was possible at 29 weeks post-conceptual age in one infant with birthweight 900 g. He was offered small amounts of expressed breastmilk (EBM) from the seventh day; this was gradually increased to the full amount required.

Out of 11 cases in this group, five infants (45.4 per cent) could be started with cup feeds and the remaining six (54.6 per cent) needed initial tube feeding before starting cup feeds of EBM or direct breastfeeding. The duration of cup feeding was 6–30 days, with a mean of 13 days.

Three infants were discharged on direct breastfeeding only; four infants on cup feeds only; and four on mixed feeding (EBM by cup and breastfeeding).

#### Group II (31–34 weeks)

Earliest cup feeding was possible at 31 weeks and 2 days post-conceptual age. Out of 37 cases, 19 infants (52 per cent) could be started with cup feeds, 15 infants (40 per cent) needed initial tube feeds, and the remaining three infants (8 per cent) were directly breastfed from the beginning.

The duration of cup feeding was 1–7 days, with a mean of 3 days. Twenty-two infants (59 per cent) were discharged on exclusive breastfeeding, one (2.5 per cent)

on cup only feeds, and 14 babies (38.5 per cent) on mixed feeding (cup feeds with breastfeeding).

#### Group III (35–37 weeks)

The earliest cup feed was possible on the first day after birth. Six infants (56 per cent) out of 11 could take feeds from the cup, two (18 per cent) needed initial tube feeds and the remaining three infants breastfed from the beginning.

The duration of cup feeding in this group was 5–6 days. Eight infants (73 per cent) of this group were discharged on exclusive breastfeeding, one on cup feeds alone, and two on mixed feeding.

### Discussion

Cup feeding is a simple, practical, and inexpensive method of feeding small babies. In situations where an alternative to bottle and gastric tube feeding is required, cup feeding provides a simple and effective solution. It provides a positive oral experience for the baby. It is non-invasive, thus any real or theoretical possibility of 'sucking confusion', or 'nipple confusion' is avoided because the infant does not have to deal with a nipple or teat in the mouth. Selley *et al.*<sup>6</sup> have identified seven common factors in co-ordinated neonatal feeding and speech production, namely the system of breath control, lip tone, delicate tongue movements, speed of muscle movements, a well developed sensory feedback system, and a relaxed feeding situation. Cup feeding appears to encourage the development and maturation of these factors. It may also be important to provide a positive oral experience to an infant who has been fed by tube. Vomiting is unusual after cup feeding, regardless of quantity taken. In the present study earliest cup feeding was possible 1 week after birth in a baby born at 29 weeks gestational age with a birthweight of 900 g. The baby

was offered small amounts of expressed breastmilk from the seventh day, which was gradually increased to the full amount required. In group II, earliest cup feeding was possible at 31 weeks and 2 days of gestational age and in group III on the first day after birth. Our observations are consistent with those of Sandra Lang<sup>7</sup> who could cup feed an infant at 30 weeks of gestational age. While cup feeding, the infant can control the pace of sucking/licking as long as the cup is held; respiration is easier to control, and swallowing occurs when the infant is ready. As a result, very little energy is required.

Cup feeding is a skill that can be acquired by preterm infants at a stage when, developmentally, they are unable to breastfeed efficiently and when it is generally assumed that they require feeding by bottle.<sup>8,9</sup> In our study, in group I only 5/11 infants (45.4 per cent) could be started on direct cup feeds and the remaining six babies needed tube feeds before starting cup feeds or breastfeeding. In group II, 19 infants (52 per cent) out of 37 could be started on cup feeds and 15 infants (48 per cent) needed initial tube feeds, the remaining three were breastfed. In group III, six babies (56 per cent) out of 11 could feed directly from the cup and only two babies (18 per cent) needed initial tube feeds. Thus, cup feeding provides a successful alternative method of feeding where direct breastfeeding is not possible. A greater number of infants in group I needed initial tube feeds and more infants from groups II and III could take direct cup feeds compared to group I infants. In fact, according to standard medical literature, co-ordinated oral feeding cannot successfully begin until an infant is between 32 and 35 weeks of gestation when it is able to co-ordinate its sucking, swallowing, and breathing.<sup>10,11</sup>

Out of 59 infants, a total of 33 infants (55.9 per cent) could be discharged on exclusive breastfeeding, 26 (44.1 per cent) on cup feeds or mixed feeding. In group I, none of the infants could be breastfed directly; all needed either initial tube feeds or cup feeds and only three infants (23 per cent) could be discharged on exclusive breastfeeding. In group II, out of 34 infants on cup feeds, 19 infants (59 per cent) could be discharged on exclusive breastfeeding.

In group III, out of eight infants who were cup fed, five (62.5 per cent) could be discharged on exclusive breastfeeding. This shows that of the infants who were

cup fed, 23 per cent from group I, 59 per cent from group II, and 62.5 per cent from group III could achieve exclusive breastfeeding by the time of discharge. Thus cup feeding can contribute to the establishment of successful breastfeeding in a short period.

The observation does show that increased gestational age improves the chances of establishing successful breastfeeding early and the cup method is a useful alternative to bottles in those babies who cannot manage direct breastfeeding.

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