JOGNN

RESEARCH

Estimated Breastfeeding to Support Breastfeeding in the Neonatal Intensive Care Unit

Jenny Ericson and Renée Flacking

Correspondence
Jenny Ericson, RN, MSc, Department of Pediatrics, Falu Hospital, 79182 Falun, Sweden.
jenny.ericson@ltdalarna.se

Keywords
breastfeeding
medical record
neonatal intensive care units
preterm birth
tube feeding
qualitative research

ABSTRACT

Objective: To evaluate the effects of estimated breastfeeding on infant outcomes in comparison to test weighing and to describe staff members' experiences of estimated breastfeeding as a method for supporting the transition from tube feeding to breastfeeding.

Design: A mixed method evaluation.

Setting: Neonatal Intensive Care Unit (NICU) in Sweden.

Participants: The study included 365 preterm (25^{th}–36^{th} gestational weeks) infants and 45 nurses or nurse assistants.

Methods: A retrospective comparative medical record study was used to assess infant outcomes during a period of test weighing (196 infants) and again after the implementation of estimated breastfeeding (169 infants). A qualitative survey was conducted to explore the staff experiences of estimated breastfeeding.

Results: No differences were found between groups regarding duration of tube feeding, length of hospital stay, gestational age, weight at discharge, and rate of any breastfeeding. Infants in the estimated breastfeeding group had a higher risk of not being exclusively breast milk fed than infants in the test-weighing group (OR = 2.76, CI [1.5, 5.1]). Staff perceived estimated breastfeeding as a more facilitative and less stressful method for mothers than test weighing. Some staff had difficulty following guidelines while simultaneously providing person-centered care.

Conclusions: Estimated breastfeeding is a nonintrusive and feasible method for assessing and supporting the transition from tube feeding to breastfeeding among preterm infants in a NICU. However, the increased risk for not being exclusively breastfed is of concern. Additional research is needed to assess whether this method is appropriate and feasible in varying contexts and cultures.

JOGNN, 42, 29-37; 2013. DOI: 10.1111/j.1552-6909.2012.01423.x

Accepted August 2012

Jenny Ericson, RN, MSc, is a neonatal nurse in the Department of Pediatrics, Falu Hospital, Falun, Sweden.

Renée Flacking, RN, PhD, is a senior lecturer for the School of Health and Social Studies, Dalarna University, Falun, Sweden and a researcher in the Department of Women's and Children's Health, Uppsala University, Uppsala, Sweden.

The authors report no conflict of interest or relevant financial relationships.

Breast milk is the best nutrition for the preterm (<37 gestational weeks [gw]) infant because of increased immunological protection, improved gastrointestinal function, and enhanced cognitive development (Anderson, Johnstone, & Remley, 1999; Gartner et al., 2005; Schanler, Shulman, & Lau, 1999; World Health Organization, 2003). Growth velocity during hospitalization is crucial as it exerts an important, and potentially independent, impact on neurodevelopment (Ehrenkranz et al., 2006). Despite these benefits, the rates of breastfeeding are much lower among preterm infants than term infants, and breastfeeding at discharge varies widely between units and countries from less than 20% to more than 90% (Akerstrom, Asplund, & Norman, 2007; Bonet et al., 2011; Collins et al., 2004; Flacking, Nyqvist, & Ewald, 2007). Sweden has high rates of breastfeeding: 69% of term infants and 60% of preterm infants are breastfed at six months (Flacking et al.). Potential influencing factors for these high rates are public spending on family benefits such as parental leave and a low-income inequality (Flacking, Dykes, & Ewald, 2010; Flacking et al.; Hauck & Irurita, 2002; Scott & Mostyn, 2003). However, since 2004 the rate of exclusive breastfeeding for all Swedish mothers has continuously decreased (National Board of Health and Welfare, 2011).

Compared to term infants, preterm infants have an immature and disorganized sucking pattern that delays the attainment of exclusive breastfeeding. However, research has shown that infants can root, efficiently grasp the areola, and perform short sucking bursts as early as 29 weeks and achieve nutritional breastfeeding from 31 weeks

Estimated breastfeeding is the predicted intake of milk during breastfeeding based on a daily weight.

(Nyqvist, 2008). Nevertheless, the transition period from tube feeding to breastfeeding varies in length. Internationally, the evidence base for supporting mothers/infants in the transition from tube feeding to breastfeeding is lacking, and as a consequence, care is regulated by guidelines and routines that are not evidence based (Klingenberg, Embleton, Jacobs, O'Connell, & Kuschel, 2012). In some Neonatal Intensive Care Units (NICUs), routines for initiating enteral feeding/breastfeeding are regulated and based on traditional criteria, such as the infant should tolerate oral feeding by bottle before being breastfed or have attained a specific gestational age or weight (Reyna, Pickler, & Thompson, 2006). Hence, care is not based on more scientific evidence, such as breastfeeding can be initiated when the infant is physiologically stable, irrespective of gestational age or weight (Callen & Pinelli, 2005; Nyqvist).

In many NICUs in Sweden, including the setting for this study, test weighing has been used as a method for determining milk intake. With this method the infant is weighed before and after each breastfeeding session. Although test weighing is suggested to be a reliable method for assessing intake (Haase, Barreira, Murphy, Mueller, & Rhodes, 2009), it does not appear to be beneficial for maternal role development or mother/infant interaction (Hall, Shearer, Mogan, & Berkowitz, 2002; Hurst, Meier, Engstrom, & Myatt, 2004). The incentives for constructing a new care routine in the NICU were that mothers in Swedish NICUs found test weighing to be "troublesome"; they had to disregard their own and their infants' needs and cues (Flacking, Ewald, Nyqvist, & Starrin, 2006). In addition, staff in the NICU experienced test weighing as stressful for the mothers (Petersen, Petersen, & Flacking, 2004). Hence, there was a need for an alternative method to test weighing to accommodate the assessment of milk intake as well as the support of the maternal/infant relationship. The aim of this quality improvement study was to develop, implement, and evaluate a non-intrusive method for estimating milk intake during the transition from tube feeding to breastfeeding.

Based on practices in some NICUs in Sweden, in 2005 guidelines on estimated breastfeeding were developed and implemented by a group of four nurses/assistant nurses working in the NICU. In the evaluation of this project, the primary aim was to assess the effects of estimated breastfeeding on infant outcomes (e.g., duration of tube feeding, length of hospital stay, weight gain during hospital stay, gestational age and weight at discharge, and feeding at discharge) compared to test weighing. A secondary aim was to evaluate how staff experienced estimated breastfeeding in comparison to test weighing.

Methods

Setting

The NICU was a Level-2 unit located in a county hospital in Sweden. The NICU had 16 cots, of which six were for intensive care (i.e., infants admitted from 25 gw; provision of continuous positive airway pressure or mechanical ventilation for as long as needed). There were facilities for eight mothers to room-in. The NICU had its own human milk bank, and bottles were rarely used and usually only when the mother or infant had a diagnosis or medication preventing breastfeeding (Flacking, Nyqvist, Ewald, & Wallin, 2003). The NICU staff had implemented Kangaroo Mother Care (KMC), although not systematically, a method proven highly beneficial for breastfeeding outcomes (Ahmed & Sands, 2010). The Newborn Individualized Developmental Care and Assessment Program (NIDCAP) was used at the NICU to support infant development.

During 2003 to 2004 (the period when test weighing was used), 2005 (the year when estimated breastfeeding was developed and implemented), and 2006 to 2007 (the period when estimated breastfeeding was used), the policy on prescribed milk volume, number of feedings, and discharge criteria were not changed. A daily set volume of breast milk was prescribed for each infant, depending on the infant's weight gain, age in days from delivery, and medical condition with a target volume of 170 to 200/ml/kg (Agostoni et al., 2010). This daily volume was then divided by the number of feedings appropriate for the infant's age and well-being, starting with 12, 10, or 8 feeds/day and possibly decreasing the number of feeds until the infant was demand feeding.

All infants were tube fed (or cup fed) until breastfeeding was established. Non-nutritive sucking was encouraged. Infants' sleep–wake states and feeding cues were acknowledged, and infants could be fed (either at breast or by tube) based on their signals rather than at scheduled times. During tube feeding the infant was observed and if he