



Challenging Expected Patterns of Weight Loss in Full-Term Breastfeeding Neonates Born by Cesarean

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ABSTRACT

Objective: To determine the mean weight loss (MWL) of newborns and to examine the effect of weight loss > 7% on exclusive breastfeeding rates.

Design: A secondary analysis from a retrospective case–control study of maternal hydration and neonatal weight.

Setting: A Level III maternity hospital in the Northeast region of the United States.

Participants: A total of 286 women and their term breastfeeding newborns born by cesarean.

Methods: Data were collected by chart review from birth through Days 3 or 4. Newborns who lost more than 7% of birth weight by Day 3 were included in the case group, and newborns who lost 7% or less by Day 3 were included in the control group. A significance level of .05 was used for all statistical analysis.

Results: Day 3 MWL for all newborns was 8% ($n = 286$, $7.9\% \pm 2.2\%$). MWL for the control group ($n = 121$) was 6% ($5.93\% \pm 1.31\%$), and MWL for the case group ($n = 165$) was over 9% ($9.35\% \pm 1.38\%$). Predominately breastfed newborns were still losing weight on Day 4 (MWL = 7.58%). Newborns who lost 7% or less had little change in exclusive breastfeeding, from 87% to 80% by Day 4. In contrast, exclusive breastfeeding in newborns who lost more than 7% dropped markedly, from 90% to 53% ($p < .001$).

Conclusion: Weight loss of more than 7% appears to be a normal phenomenon among full-term newborns. When weight loss reached 7%, formula supplementation increased markedly. Predominately breastfed newborns are most at risk for continued weight loss after hospital discharge.

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Breastfeeding initiation rates in the United States are currently 75%, which is higher than they have been since the mid-20th century. However, the 2013 [Centers for Disease Control and Prevention Breastfeeding Report Card](#) indicated that at 3 and 6 months, exclusive breastfeeding (EBF) rates were only 38% and 16%, respectively. Despite well-known contraindications, many women begin to supplement breastfeeding with formula in the first few days of life. Women choose to offer formula for many reasons, but a primary reason is concern about their newborns' health ([Waldrop, 2013](#)). When breastfed newborns lose too much weight after birth, health care providers often get concerned that there is a problem with breastfeeding ([American Academy of Pediatrics \[AAP\], 2012](#)). This concern is expressed to parents, who then worry that their newborns are hungry. Formula is given to help newborns gain weight, but this frequently results in

an earlier end to breastfeeding ([Brown, 2015](#)). Unfortunately, this scenario plays itself out daily in today's health care systems in the United States.

There are multiple factors that can affect the amount of weight lost after birth. Newborn size and gestational age influence weight loss. Researchers found that preterm (born before 34 weeks gestation) and late-preterm newborns (born between 34 and 36 6/7 weeks gestation) lose more weight than full-term newborns (born after 37 weeks gestation; [Goyal, Attanasio, & Kozhimannil, 2014](#); [Moyses, Johnson, Leaf, & Cornelius, 2013](#)). Additionally, full-term newborns who are small (<2,500 g) or large for gestational age (>4,000 g) are also at increased risk for weight loss ([deRooy & Hawdon, 2002](#)).

Many other factors may contribute to excess neonatal weight loss. Insufficient milk supply caused

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by failed lactogenesis II (the onset of copious milk secretion) is frequently cited as a cause (Tawia & McGuire, 2014). This phenomenon is often related to breastfeeding difficulties such as a mother's pain with feedings, ineffective suckling, poor latch, or mother–newborn separation (Hurst, 2007). Although less common, other causes of failed lactogenesis II may include breast surgery, retained placenta fragments, hypothyroidism, mammary hypoplasia, polycystic ovarian syndrome, and Sheehan's syndrome (Arbour & Kessler, 2013). Other common factors associated with increased newborn weight loss include female sex, advanced maternal age and education, cesarean birth, and jaundice (Davanzo, Cannioto, Ronfani, Monasta, & Demarini, 2013; Fonseca, Severo, Barros, & Santos, 2014). Intravenous fluid administered during the intrapartum period has also been associated with increased weight loss in newborns (Dewey, Nommsen-Rivers, Heinig, & Cohen, 2003; Tawia & McGuire, 2014). Finally, rare and undiagnosed metabolic or neurological disorders in newborns may contribute to weight loss (Tawia & McGuire, 2014).

One of the most frequently used measures to assess a newborn's well-being is weight loss. Expected physiologic weight loss for breastfed newborns is 5% to 7% (Dewey, Nommsen-Rivers, Heinig, & Cohen, 2003). When weight loss is greater than 7%, common practice is to provide formula supplementation (Gagnon, Leduc, Waghorn, Yang, & Platt, 2005). Multiple professional organizations, including the International Lactation Consultant Association (2005), the Academy of Breastfeeding Medicine (2009), and the AAP (2012), suggest that exclusively breastfed newborns who exceed 7% weight loss should be evaluated for poor breastfeeding management. Among clinicians, there is little consensus regarding how to define too much weight loss. At times, more than 7% loss of birth weight is used (Watson, Hodnett, Armson, Davies, & Watt-Watson, 2012) and at other times, 10% or greater was used to define excessive weight loss (Bertini, Breschi, & Dani, 2014).

In 2016, I conducted a systematic review of expected patterns of weight loss in full-term breastfed neonates. I documented how little reliable evidence exists to support 5% to 7% weight loss as a guide to practice. Mean neonatal weight loss ranged widely among studies from 3.79% to 8.6%. In addition, significant methodologic flaws were reported in the research that was used to establish 5% to 7% as a guide to practice. These

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flaws included gaps in data collection, lack of a documented feeding type in the studies, sample groups that lacked exclusively breastfed neonates, and the exclusion of neonates who lost the most amount of weight from sample groups (Thulier, 2016).

Evidence has shown that the growth of breastfed newborns has been judged by a standard that was derived from data collected on newborns who were largely formula fed (AAP, 2012; Crossland, Richmond, Hudson, Smith, & Abu-Harb, 2008). Only since 2010 have growth charts from the World Health Organization reflected growth patterns among children predominantly breastfed (Centers for Disease Control and Prevention, 2010). Despite these facts, there is little discussion in the literature about the effect of weight loss greater than 7% on breastfeeding outcomes. Researchers have not examined the frequency of formula supplementation given for excess weight loss or the effect of weight loss on breastfeeding rates.

Therefore, the purpose of this study was to determine the mean weight loss (MWL) for healthy, full-term breastfed newborns born by cesarean and to evaluate the effect of weight loss greater than 7% on EBF rates. It was hypothesized that newborns who were exclusively or predominantly breastfed would have a MWL greater than 7% and that newborns who lost more than 7% of birth weight would have lower rates of EBF compared with newborns who lost 7% or less of their birth weight.

Methods

Design

A case–control research design was used to examine the relationship between EBF rates when newborns lost 7% or less of their birth weight versus more than 7%. Data for this study were obtained through a secondary analysis of the data acquired from a previous study in which I investigated the relationship between maternal hydration in labor and newborn weight loss (Thulier, 2013). Newborns born by cesarean composed the sample groups because these mother–newborn dyads remained hospitalized for 3 to 4 days after birth, and access to reliable data

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