Introducing Newborn Weight Loss Curves to Mothers to Encourage Exclusive Breastfeeding: A Quality Improvement Project

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Abstract

The benefits of exclusive breastfeeding for the first six months of life for infants and their mothers have been well-documented. One of the maternal concerns identified as a barrier to breastfeeding is the concern that the infant is not exhibiting adequate growth or maintaining sufficient nutrition, despite that the average breastfed infant loses approximately 7% of the birth weight in the days following birth. Flaherman, et al developed a weight loss nomogram in order to identify how an exclusively breastfed term infant compares to a large sample of exclusively breastfed newborns. Our goal was to utilize this nomogram to help alleviate maternal concerns regarding infant growth while breastfeeding. In the month prior to our study, 37.3% of mothers in our Pediatricx Couplet Care population who were initially exclusively breastfeeding introduced formula into their newborns’ diets prior to discharge from the hospital. In our project, we aimed to decrease the percentage of mothers who switched from exclusive breastfeeding to formula supplementation. Over two PDSA cycles, we plotted the newborns on the weight loss curves and presented this information to the mothers in an attempt to educate them on normal newborn weight loss patterns and to encourage continued exclusive breastfeeding. We then reviewed whether the mother provided formula supplementation to the infant at any point in the postpartum stay. The percentages of subjects who introduced formula after initially exclusively breastfeeding in Cycles 1 and 2 were 15% and 13.3%, respectively. Thus, for the period during which our project was implemented, the percentage of breastfeeding mothers who introduced formula in Cycles 1 and 2 decreased by 22.3 and 24, respectively. In addition, 100% of women in the second PDSA cycle reported that the information helped them feel more comfortable with breastfeeding. While additional studies would be useful in helping to establish causation or application to a larger population, this project introduces the idea of educating mothers on normal weight loss patterns of breastfed infants in order to alleviate concerns about infant growth and encourage exclusive breastfeeding.

Introduction

Exclusive breastfeeding for at least the first six months of life has been associated with improved health outcomes for newborns and mothers. Positive outcomes include decreased infections of the child, such as otitis media, upper and lower respiratory tract infections, and gastroenteritis; as well as decreased risk of atopy, obesity, diabetes, leukemia, and Sudden Infant
Death Syndrome (2,4). Breastfeeding has also been associated with decreased risks of maternal breast and ovarian cancer (2,4). The CDC’s most recent reports, however, show that 80% of mothers in 2012 ever breastfed with only 51.4% still breastfeeding at six months. Breastfeeding rates in South Carolina were lower than the national average with 66.8% of mothers ever breastfeeding and only 38.4% breastfeeding at six months (1). Maternal concerns regarding breastfeeding include concerns about difficulty with breastfeeding or lactation, breastfeeding pain, milk quantity, infant nutrition and weight, maternal illnesses or need to take medicine, the effort involved with pumping milk, and lifestyle factors (5-7). The normal weight progression for a newborn infant is a weight loss of up to 7% of the birth weight in the first days of life; however, mothers cite infant nutrition and weight concerns as reasons to cease exclusive breastfeeding and initiate formula supplementation.

A study by Flaherman, et al developed a weight loss nomogram in order to identify how an exclusively breastfed term infant compares to a large sample of exclusively breastfed newborns (3). The nomogram was incorporated into newborn weight loss curves and the Newborn Weight Tool (NEWT) website which is a chart on which newborn weight loss can be plotted to identify which percentile of weight loss the infant falls in. The nomogram is intended to detect which newborns are losing excessive weight after birth in order to provide early intervention.

Our plan was to use the newborn weight loss curves to provide mothers with a visual representation of how their infants compared to the average exclusively breastfed infant. The goal of this project was to decrease the percentage of mothers who switched from exclusive breastfeeding to formula feeding or supplementation by 5%. We worked to accomplish this goal by helping to alleviate concerns about infant nutrition and weight loss. We planned to incorporate the use of the weight loss curves in the discussion with mothers on daily resident rounds. By providing mothers with a visual representation of where their babies’ weights fell on the normal weight loss curve, we hoped to reassure them about their ability to provide nourishment to their babies through breast milk alone.

**Methods**

The population for our study consisted of infants in the Pediatrix Medical Group Couplet Care at PHR. Subjects were initially excluded if mothers did not initiate breastfeeding, for gestational age less than 37 weeks or greater than 42 weeks, if patient had to stay in the Special Care Nursery, multiple gestation deliveries, or for birth weight less than 2000 grams or greater than 5000 grams. Subjects were excluded during data analysis if formula was recommended for medical indications, such as excessive weight loss or hypoglycemia. The Palmetto Health Lactation Consultants keep record of breastfeeding rates in our facility which were used for baseline data. The breastfeeding initiation rate in our patient population in the month of December 2015 (the month prior to initiating the study) was 86%. The exclusive breastfeeding rate, which includes those patients in which formula was used only for medical supplementation,
for the same month was 54%. Thus, 37.3% of mothers that had initiated breastfeeding introduced formula into the infant’s diet prior to discharge from the hospital for reasons other than recommended medical supplementation.

Our study consisted of two PDSA cycles with the first cycle taking place from January 18, 2016 to February 17, 2016 and the second cycle taking place from March 8, 2016 to April 11, 2016. In our project, the residents on the Newborn rotation plotted each exclusively breastfed patient’s daily weight on a paper weight loss percentile curve. They then showed the mother where the patient’s weight fell on the curve. They discussed the weight loss curve to the mother explaining that there are normal patterns of weight loss in breastfed infants and explaining where the patient lies on the curve. The infant’s age at the time the weight was taken, the age at the time the chart was shown to the mother, the weight loss percentile, and whether formula supplementation was recommended for medical indications was documented by the resident in a table. The methods of the second PDSA cycle were the same as the first except the curve was generating using the NEWT website instead of charting on the paper copies of the growth curves. Also, in the second cycle, the mom was asked the additional question: “Does this information help you to be more comfortable with breastfeeding?” The mother’s response to the question was then documented in the table.

After discharge, we reviewed the EMR to identify if any of the mothers gave formula to their infant after this discussion. We counted the number of mothers who initiated breastfeeding and, of that group, the number that later introduced formula supplementation. Using these values, we calculated the percentage of mother’s who transitioned from exclusive breastfeeding to formula-feeding. We then compared these percentages to our baseline data.

**Results**

In our first PDSA cycle, 22 participants met inclusion criteria and initiated breastfeeding. Two patients were later excluded as medical supplementation was recommended for one due to hypoglycemia and the other due to weight loss of greater than 10%. Of the remaining participants, three mothers introduced formula prior to discharge. In the second PDSA cycle, 16 participants met inclusion criteria and initiated breastfeeding. One subject was later excluded as medical supplementation was recommended secondary to weight loss of greater than 10%. Of the remaining participants, two mothers later introduced formula. During the second PDSA cycle, 100% of mothers reported that the information regarding where their newborn’s weight loss plotted on the curve helped them to feel more comfortable with breastfeeding.

After excluding the patients for which medical supplementation was recommended, 3 out of 20 subjects (15%) for Cycle 1 and 2 out of 15 subjects (13.3%) for Cycle 2 initiated formula feeding prior to discharge (See Figure 1). Thus, in total, 5 out of 35 subjects (14.3%) introduced formula prior to discharge.
Discussion

In our project, we aimed to decrease the percentage of mothers in our Pediatrix Couplet Care who introduce formula after initially exclusively breastfeeding by 5%. Our baseline data indicated that 37.3% of mothers in our patient population who had initiated breastfeeding later introduced formula prior to discharge. In PDSA Cycle 1, 3 out of 20 subjects (15%) initiated formula prior to discharge. In PDSA cycle 2, 2 out of 15 subjects (13.3%) initiated formula feeding prior to discharge. Thus, the decrease in percentage was 22.3 and 24 for Cycles 1 and 2, respectively. There was little difference in the two cycles, indicating that the use of the paper curves versus the curves generated through the website did not significantly alter the effectiveness of the intervention. The choice of whether to use the NEWT website nomogram versus using the paper weight loss curves should then depend on the preference of the individual who is plotting the weight. Overall, the decrease in percentage of mothers who introduced formula for reasons other than medical supplementation was greater than 20%, which was greater than our goal of 5%. This statistic is encouraging and suggests that, by providing mothers with the appropriate information regarding normal patterns of weight loss in newborns, we can improve exclusive breastfeeding rates in our patient population. It is also promising that 100% of mothers in the second PDSA cycle reported that the information provided to them about their infant’s weight loss in relation to other infants made them more comfortable with breastfeeding.

There are limitations to this project. While we did obtain the desired decrease in formula initiation rates upon implementing the use of the nomogram, this project does not show causation. It is encouraging that 100% of the mothers in PDSA Cycle 2 reported that the information from the study helped them to feel more comfortable with breastfeeding; however, the mothers may have been more likely to answer “yes” as they were being asked by the resident directly. They may have responded differently if the responses had been anonymous. The
baseline data and each cycle was only approximately one month, which is a limitation of the study as it would be more beneficial to observe trends over extended periods of time. The sample size was also small at only 35 subjects. There were also some lapses in obtaining data on all of the breastfeeding couplets throughout the study. Some infants were missed due to the physicians forgetting about the project when busy or different physicians covering on weekends. This limitation may be avoided by establishing this program as part of our regular curriculum, educating residents who will be cross-covering in the nursery on weekends, or by enlisting our lactation consultants who also have daily rounds.

It would be helpful to modify our methods by presenting the weight loss curve to the mother immediately when the infant’s weight is obtained. In our facility, infants are weighed at night. In our project, we were presenting the information to the mothers on our morning resident rounds, thus, allowing 10-12 hours in which the mom could ask for formula without having the information about her infant’s weight loss percentile. It would be helpful to enlist the night shift nurses or nurse technicians in the project or to weigh our infants in the morning, instead. Further studies with an expansion of the project to other populations with a larger sample size and time frame would be helpful. It would also be beneficial to follow the patients beyond the postpartum hospital stay to determine if the pattern of exclusive breastfeeding continues after discharge from the hospital.

References

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