

Research Project
Leah Dobbins, Aabha Beri & Parm Kaur

Project Title

Prevalence of Breastfed Newborns at the Family Medical Center in Peoria, Illinois.

Abstract

A retrospective research study was conducted by reviewing charts of mothers who were delivered by residents and faculty members as well as first well newborn visits at the Family Medical Center in 2011 and 2012. Of 975 charts reviewed, a total of 219 charts met the inclusion criteria. A prevalence of exclusive breastfeeding was found to be 21.92%. Infants born to African American mothers and those residing in zip codes associated with lower socioeconomic status were less likely to be exclusively breastfed. The prevalence of exclusive breastfeeding of 21.92% at Family Medical Center is significantly lower than the 2012 Illinois national average of 35.7% exclusive breastfeeding at 3 months. Unless contraindicated, mothers should be encouraged to have immediate skin-to-skin contact with their infants through the first feeding, feed on demand, and avoid supplementation to increase likelihood of breastfeeding success. (23) In order to improve breastfeeding rates, we propose providing additional early education during prenatal visits outlining the benefits of breastfeeding for mothers and infants.

Introduction

Human breast milk is recommended as the sole nutritional source for term infants for the first 6 months of life. (1) Breastfeeding provides short and long term benefits to the infant as well as the mother. Not only is breastfeeding beneficial to mother and baby, but it also has significant economic benefits for the family and society.

The gastrointestinal system of infants is significantly impacted by the use of breast milk as a nutritional source. Breast milk contains growth factors, such as epidermal growth factor (EGF) and nerve growth factor that impact intestinal tract development and may protect against invasive disease. Hormones such as cortisol, somatomedin-C, insulin, and thyroid hormone may affect intestinal mucosal function and growth. Neurotensin and motilin are gastrointestinal mediators found in breast milk that may alter motility. (2). Necrotizing enterocolitis risks may be reduced by interleukin 10 and anti-inflammatory compound found in breast milk (3,4)

An infant's immune system is also affected by the use of breast milk. Human milk contains unique components such as secretory IgA, secreted by maternal plasma cells, which provides passive immunity against antigens to which mother has been exposed (5,6), neutrophils and macrophages which contribute to antimicrobial activity (7). In developed countries, breastfed infants have a lower rate of hospitalization and outpatient visits in the first year of life. (8,9).

Breastfeeding has also shown to have long term benefits to the infant. Breastfed infants have lower rates of acute illnesses, decreased risk of chronic diseases such as: obesity (10), cancer (11), adult coronary artery disease (12), inflammatory bowel disease (13), and improved neurodevelopmental outcome compared to formula fed infants (14).

Not only is breastfeeding beneficial to infants, it also provides advantages for the mother. Maternal benefits include reduction of maternal response to stress (15), enhanced weight loss after pregnancy (16), a reduction in the risk of breast cancer (17), and decreased risk of hypertension, diabetes and cardiovascular disease. (18)

In addition to the health benefits of breastfeeding, the economic impact of choosing to breastfeed is staggering at both the familial and societal level. The family can benefit from the estimated

yearly savings of \$1000 on formula. Additional savings for families are accrued by decreased healthcare expenses of breastfed infants. (19) The national cost savings in the year 2007 would be 13 billion dollars if 80 to 90 percent of families in the United States exclusively breast fed for six months. (20)

The CDC reports that in 2009, the breast feeding initiation rate was 76.9%, which had increased from 74.6% in 2008. (21) In 2009, the USDA implemented changes to the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The new options included a full breastfeeding package with no infant formula, a partial breastfeeding package with some infant formula, and a full formula package with a smaller postpartum food package for the mother. These changes were implemented to encourage WIC mothers to choose breastfeeding as the sole nutritional choice for their infants. After the changes, the percentage of mothers who received the full breastfeeding package rose from 9.8% to 17.1%, while the percentage of mothers who received the full formula package rose from 20.5% to 28.5%. (22) Although more WIC mothers received the full breastfeeding package, more mothers also received the full formula package.

In 2012, the CDC reported that in the state of Illinois, 76.8% of women ever breastfed, 49.8% were breastfeeding at 6 months, 25.3% were breastfeeding at 12 months, 35.7% exclusive breastfeeding at 3 months and 13.6% exclusive breastfeeding at 6 months. The Healthy People 2020 Breastfeeding Objectives set targets of ever breastfeeding at 81.9%, six months breastfeeding at 60.6%, one year breastfeeding at 34.1%. (21)

Given the significant medical benefits and financial impact that breastfeeding can have, we would like to evaluate the prevalence of breastfeeding in our clinic population at the Family Medical Center. We will perform a retrospective review of the prevalence of breastfeeding infants at the Family Medical Center in Peoria County, Illinois and assess whether or not these patients are meeting national standards for breastfeeding rates.

Methods

Our methods included a retrospective review of all charts for mothers who were delivered by our residents and faculty members as well as first well newborn visits at the Family Medical Center in 2011 and 2012. All investigators took part in identifying and reviewing records. Newborns charts that did not state feeding type were not included in the study. Newborns with reported feeding types were divided into three categories: solely breastfed, solely formula fed, or combined formula fed and breastfed. Recorded data included: Age of newborn at first visit and feeding type, maternal race, marital status, maternal age, number of living children and socioeconomic status determined by zip code.

The inclusion and exclusion criteria are as follows:

Inclusion criteria:

- Charts with documentation of prenatal care provided by faculty or residents at the Family Medical Center.
- First newborn visit to FMC charts with documentation of feeding type (breast, formula, or both).

Exclusion criteria:

- Prenatal care provided outside of Family Medical Center with the exception of consultation by Perinatology.
- Babies that did not received their initial newborn care at our clinic.
- First newborn visit to FMC charts with NO documentation of feeding type (breast, formula, or both).

Results

Initial total number of charts reviewed of mom and infant pairs was 975. Final number of charts included for the study was 219 after meeting inclusion criteria. Prevalence of exclusive breastfeeding at Family Medical Center is 21.92%.

Mean maternal age of exclusively breastfeeding mothers was 24.8+/- 6.4 years and 24.1+/-5.1 years for those who either used formula or combined feeding. There was no statistical significance amongst maternal age and breastfeeding (p=0.448).

Mean age of exclusively breastfed infants was 5.6+/-4.2 days and 9.5+/-9.7 days for those who were either fed formula or combined feeding. Infant age was found to be of statistical significance when determining type of feeding (p=0.008).

Number of children in the home and rate of breastfeeding did not reveal any statistical significance (p=0.178).

Analysis of maternal race and breastfeeding revealed statistical significance with p-value of 0.014 with 17/122 (13.93%) African Americans, 18/57 (31.58%) Caucasian, 2/8 Hispanic, and 11/32 Other, exclusively breastfeeding.

Maternal marital status did not reveal any statistical significance (p=0.052). Considering 48 breastfed infants, 16 (33.3%) were born to married mothers whereas 32 (66.7%) were born to single mothers.

Residential zip codes of mothers were grouped into three zones based on proximity to Family Medical Center with Zone 1 being in closest proximity and Zone 3 being farthest. Zone 1 includes 61601 to 61611, Zone 2 includes 61614 to 61616, and Zone 3 includes all other zip codes of mothers included in the study.

Conclusions

Given the significant medical benefits and financial impact that breastfeeding can have, we chose to evaluate the prevalence of breastfeeding in our clinic population at the Family Medical Center (FMC). Our hypothesis that the prevalence of breastfeeding in our patient population was below the national average was confirmed by our study.

Our results indicate a prevalence of 21.92% exclusive breastfeeding at first well child check. This finding is much lower than the CDC reporting of 35.7% exclusive breastfeeding at 3 months in Illinois in 2012. (21) Mothers who reside in closest proximity to FMC (Zone 1) were less likely to exclusively breastfeed when compared to those who lived in Zone 3 which represents zip codes farthest distance from FMC. African American mothers were less likely to exclusively breastfeed (13.93%) when compared to Caucasians (31.58%) and Hispanics (25%). Early newborn follow-up after discharge from hospital is essential and this was confirmed with our findings. Earlier follow-up after delivery was associated with higher rates of exclusive breastfeeding. Number of children at home or maternal age did show a statistical significance when looking at rates of exclusive breastfeeding.

As family physicians we have a unique role in impacting our patients' lives even before birth. It then only makes sense for us to educate mothers about breastfeeding given its lifelong benefits for the mother and child. Considering our findings, we must place additional emphasis on educating our target population of African American females who live in closest proximity to Family Medical Center. We must also stress close newborn follow-up after hospital discharge.

Limitations of our study include a small sample size and lack of differentiation between vaginal and cesarean delivery. Also, we did not take into account the duration of prenatal care provided at our clinic. It is difficult to compare the prevalence of exclusive breastfeeding at Family Medical Center with the national average as we only considered first newborn visit whereas the national data represents rates of exclusive breastfeeding at 3, 6, and 12 months.

Future studies may include a larger sample size by including other local clinics (ie. Carver and Havana), take into consideration the type of delivery, and factor in the role of lactation consultations. For a fair comparison to the national rates, a longitudinal study would be required.

References

1. [Section on Breastfeeding. Breastfeeding and the use of human milk. Pediatrics 2012; 129:e827.](#)
2. [Rodriguez-Palmero M, Koletzko B, Kunz C, Jensen R. Nutritional and biochemical properties of human milk: II. Lipids, micronutrients, and bioactive factors. Clin Perinatol 1999; 26:335.](#)
3. [Garofalo R, Chheda S, Mei F, et al. Interleukin-10 in human milk. Pediatr Res 1995; 37:444.](#)
4. [Fituch CC, Palkowetz KH, Goldman AS, Schanler RJ. Concentrations of IL-10 in preterm human milk and in milk from mothers of infants with necrotizing enterocolitis. Acta Paediatr 2004; 93:1496.](#)
5. [Kleinman RE, Walker WA. The enteromammary immune system: an important new concept in breast milk host defense. Dig Dis Sci 1979; 24:876.](#)
6. [Fishaut M, Murphy D, Neifert M, et al. Bronchomammary axis in the immune response to respiratory syncytial virus. J Pediatr 1981; 99:186.](#)
7. [Lönnerdal B. Biochemistry and physiological function of human milk proteins. Am J Clin Nutr 1985; 42:1299.](#)
8. [Oddy WH, Sly PD, de Klerk NH, et al. Breast feeding and respiratory morbidity in infancy: a birth cohort study. Arch Dis Child 2003; 88:224.](#)
9. [Ladomenou F, Moschandreas J, Kafatos A, et al. Protective effect of exclusive breastfeeding against infections during infancy: a prospective study. Arch Dis Child 2010; 95:1004.](#)
10. [Toschke AM, Vigerova J, Lhotska L, et al. Overweight and obesity in 6-14 year old Czech children in 1991: protective effect of breast feeding J Pediatr 2002; 141:764](#)
11. [UK Childhood Cancer study Investigators. Breast feeding and childhood cancer Br J Cancer 2001 85: 1685](#)
12. [Owen CG, Whincup PH, Odoki K, et al. Infant feeding and blood cholesterol: a study in adolescents and systematic review. Pediatrics 2002; 110:597](#)
13. [Koletzko S, Sherman P, Corey M, et al. Role of infant feeding practices in development of Crohn's disease in childhood. BMJ 1989; 298-1617](#)
14. [Mortensen EL, Michaelsen KF, Sanders SA, Reinisch JM. The association between duration of breastfeeding and adult intelligence. JAMA 2002 287: 2365](#)
15. [Mezzacappa ES, Kelsey RM, Katkin ES. Breast feeding, bottle feeding, and maternal autonomic responses to stress. J Psychosom Res 2005; 58:351.](#)
16. [Dewey KG, Heinig MJ, Nommsen LA. Maternal weight-loss patterns during prolonged lactation. Am J Clin Nutr 1993; 58:162.](#)
17. [Collaborative Group on Hormonal Factors in Breast Cancer. Breast cancer and breastfeeding: collaborative reanalysis of individual data from 47 epidemiological studies in 30 countries, including 50302 women with breast cancer and 96973 women without the disease. Lancet 2002; 360:187.](#)
18. [Schwarz EB, Ray RM, Stuebe AM, et al. Duration of lactation and risk factors for maternal cardiovascular disease. Obstet Gynecol 2009; 113:974.](#)
19. [Cattaneo A, Ronfani L, Burmaz T, et al. Infant feeding and cost of health care: a cohort study. Acta Paediatr 2006; 95:540.](#)

20. [Bartick M, Reinhold A. The burden of suboptimal breastfeeding in the United States: a pediatric cost analysis. *Pediatrics* 2010; 125:e1048.](#)
21. Breastfeeding Report Card- United States, 2012. www.cdc.gov/breastfeeding/data/.
22. [Wilde P, Wolf A, Fernandes M, Collins A.](#) Food-package assignments and breastfeeding initiation before and after a change in the Special Supplemental Nutrition Program for Women, Infants, and Children. [Am J Clin Nutr.](#) 2012 Sep;96(3):560-6. doi: 10.3945/ajcn.112.037622. Epub 2012 Jul 25.
23. Strategies for Breastfeeding Success. Drew Keister, MD, Kismet Roberts, MD, and Stephanie Werner, MD, Offutt Air Force base/University of Nebraska Medical Center Family Medicine Residency, Omaha, Nebraska *Am Fam Physician.* 2008 Jul 15;78(2):225-232.
24. <http://www.city-data.com/zipmaps/Peoria-Illinois.html#61615>