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Cost and Use of Pasteurized Donor Human Milk at a Children's Hospital

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ABSTRACT

Objective: To determine the cost and use of pasteurized donor human milk (PDHM) at a children's hospital with a strong human milk culture.

Design: A retrospective descriptive cohort study.

Setting: A children's hospital in the northeastern region of the United States.

Participants: Infants ($N = 281$) younger than 1 year of age at the time of hospitalization who received PDHM between January 2011 and November 2014. Infants older than 1 year of age at the time of hospitalization were excluded from the study sample.

Methods: For each eligible infant, the following descriptive characteristics were abstracted from the electronic health record: gestational age, birth weight, primary diagnosis, unit/floor, total volume of PDHM fed to infant, total number of days the infant received PDHM, diet order on day of discharge, and total length of stay in days. Descriptive statistics were used to analyze all data.

Results: Of the sample, 70% ($n = 197/281$) were cared for in the NICU and 30% ($n = 84/281$) were cared for outside of the NICU. The mean number of days an infant received PDHM was 23 days (range = 1–134 days) and the mean volume consumed daily was 195 ml (range = 6–1,335 ml). Using a purchase cost of U.S.$4.50 per ounce, the average purchase cost of PDHM per day was U.S.$29.19 (range = U.S.$0.90 to U.S.$200.23).

Conclusion: PDHM is a low-cost intervention compared with many other interventions for the care of hospitalized infants.

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In 2012, the American Academy of Pediatrics (AAP) updated its position statement on human milk and breastfeeding to include the use of pasteurized donor human milk (PDHM) if a mother's own milk is unavailable or its use is contraindicated (AAP, 2012). More recently, the AAP released a separate position statement in which it emphasized the importance of PDHM for hospitalized infants (AAP, 2017). This position statement indicated that the use of PDHM should be prioritized for very-low-birth-weight infants and possibly infants with abdominal wall defects. The AAP cited that the use of PDHM is currently limited by its affordability (purchase cost) and availability (AAP, 2017).

Background

The Human Milk Banking Association of North America (HMBANA) was established in 1985 to oversee and develop standards for milk banks in North America (HMBANA, 2015). In 2016, HMBANA milk banks dispensed 5.2 million ounces of donor milk across the United States and Canada (HMBANA, 2017). Currently, HMBANA milk banks charge approximately U.S $4.00 to U.S.$5.00 per ounce for PDHM. This processing fee covers the costs involved with screening potential donors, laboratory testing of the donor's blood and breast milk, processing the breast milk, supplies, shipping, and general overhead needed to administer a nonprofit milk bank. As an illustration, using a purchase cost of U.S.$4.50 Q1 per ounce and trophic feeds at a rate of 5 ml every 3 hours or 40 ml per day, the cost for 1 day of PDHM would equal U.S.$6.00 per day for one infant.

The AAP (2012) recommended an exclusive human milk diet for infants through 6 months of life. In the cases of hospitalization, there may be instances in which the mothers of vulnerable infants

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The use of pasteurized donor human milk is currently limited by its affordability and availability.

are not able to provide sufficient milk to meet the infants' demands. Health care providers are then faced with the question of enteral feeding supplementation, and the options for supplementation include infant formula and PDHM. If a hospital has PDHM available, parameters for use of PDHM, which include definitions of gestational age and birth weight, often limit the availability to patients. Therefore, most patients who receive PDHM in the hospital are often cared for in an intensive care unit and are not older, larger infants on a general pediatric floor.

Unfortunately, many hospitals that care for infants do not have PDHM available, and fewer than half of NICUs in the United States are using PDHM (Colaizy, 2015). Availability is limited for numerous reasons, the most prevalent of which is concern related to the cost of a safe PDHM product. Authors have theorized about the cost of PDHM as a supplement to mothers' milk (Arnold, 2002; Jegier et al., 2013; Wight, 2001). In consideration of the argument that PDHM is too expensive and thus that its use must be restricted or limited, the purchase cost of PDHM must be compared with the purchase costs of other nutrition interventions routinely used in care for critically ill neonates. For example, hospitals would not argue with providing parenteral nutrition when an infant is not able to feed enterally. At a cost of approximately U.S.$1,000 per day, total parenteral nutrition is not an inexpensive nutritional therapy and is essential to the care of vulnerable infants; however, hospital administrators argue the expense of PDHM as an enteral feeding option. Edwards and Spatz (2012) reported that during one fiscal year, a large pediatric hospital spent $155,000 to purchase PDHM from an HMBANA milk bank. During that same time frame, more than $18.4 million was spent on total parenteral nutrition in the NICU (Edwards & Spatz, 2012).

Methods

The purpose of this research project was to explore the volume of PDHM consumed by infants at The Children's Hospital of Philadelphia (CHOP) and the associated cost related to supplying PDHM purchased from an external HMBANA milk bank. Before the initiation of this retrospective descriptive cohort study, institutional review board approval was obtained from the institution. In 2011, CHOP initiated the use of an electronic health record, EPIC. Through EPIC, the institution was able to generate a list of EPIC orders for PDHM from January 2011 to November 2014. This list was reviewed and uploaded into a Microsoft Excel spreadsheet.

Setting and Participants

As a children's hospital, CHOP is not a Baby-Friendly hospital, but it is a Keystone 10–designated hospital with a strong human milk and breastfeeding culture. Families who enter care through the CHOP Center for Fetal Diagnosis and Treatment receive a personalized prenatal lactation consultation before birth with a focus on the use of human milk as a medical intervention (Froh & Spatz, 2015; Spatz, 2004). Since CHOP's Special Delivery Unit opened in 2008, 98% to 99% of mothers who gave birth on the unit initiated lactation through breast pumping. More than 81% of infants born at CHOP or admitted to CHOP's NICU within the first 7 days after birth are discharged on diets of human milk. Furthermore, the mean breastfeeding duration of infants born with complex surgical anomalies and cared for in the NICU was 8 months (range = 0.25–30 months; Martino, Wagner, Froh, Hanlon, & Spatz, 2015).

The Children's Hospital of Philadelphia has used PDHM purchased from an HMBANA milk bank for more than a decade. PDHM is not viewed as a replacement to a mother's own milk but rather a bridge to a mother's own milk. In certain cases, if a mother is unable to produce milk (bilateral mastectomy) or the use of a mother's own milk in contraindicated (HIV or illicit drug use), PDHM can be used for the duration of hospitalization (AAP, 2012). Since the use of donor milk began, CHOP's policy has been broad in scope to include a variety of infant diagnoses (see Table 1) and parental preferences for families who wish to ensure a 100% human milk diet. CHOP is committed to the use of PDHM within the parameters of the established policy. Therefore, as long as consent to the use of PDHM is signed by the parent(s) and the medical team writes an order for its use, PDHM is provided for the infant.

With CHOP's information and technology department, the research team was able to generate a list of all infants who had orders for PDHM in EPIC during hospitalization. This initial list resulted in 374 infant charts. Eligibility criteria were exclusive to any infant in any care setting within the main hospital for whom an order for

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