Epidemiological profile of donors and recipients of human milk in a reference milk bank

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Abstract

OBJECTIVE. To describe the epidemiological profile of donors and recipients of a Human Milk Bank at a referral hospital in the State of Mato Grosso do Sul.

METHODS.   This is a descriptive cross-sectional study with retrospective data from the Milk Banks Network system and secondary data from medical records of a tertiary public hospital, between January and December 2017. Descriptive statistics was performed using the Statistic Package for Social Sciences (SPSS®), version 25.0.

RESULTS. In 2017, 383 human milk donors were registered, totaling a volume of approximately 614 liters of donated milk. Of this total, 88.51% donors lived in the city of Campo Grande, state capital; 56.40% reported no paid activity; the mean age was 27.45 years; and 79.63% had prenatal care in the public network. Of the 149 recipients, 71.1% (n = 106) were premature with a median gestational age of 34.00 weeks (minimum 21.00 and maximum 42.00); and birth weight with a median of 2225.00 (minimum 660.00 and maximum 5230.00). Also, 61.1% (n = 91) of the recipients weighed less than 2,500 grams and were distributed in: extremely low weight 0.7% (n = 1); very low weight 11.4% (n = 17); low weight 49.0% (n = 73); and normal weight 38.9% (n = 58).

CONCLUSION: The donors are young women who had support from the Unified Health System for the prenatal assistance. Among human milk recipients, 61.1% are premature babies weighing less than 2,500 grams.

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ABSTRACT

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DESCRIPTORS: Breastfeeding; Milk banks; Epidemiology; Lactation.

INTRODUCTION

Human Milk (HM) is the most suitable food for early life[1]. Its offer is recommended worldwide on an exclusive basis until the sixth month of life of the newborn (NB)[2]. It is suitable for digestion, reduces morbidity and mortality and favors growth and full development[3].

Breastfeeding promotes the protection of the newborn against infections and strengthens the development of the mother/baby link through microbial and hormonal signaling. Several factors influence the composition and production of human milk, for example, the nursing mother's diet and the endocrine and breast functions, factors that can impact on the health of newborns[4].

However, other factors generated by the stresses of hospitalization and maternal withdrawal may represent difficulties for premature NBs to breastfeed, which hampers the formation of the bond between mother and baby, generating feelings of anxiety, fear and insecurity in the nourishing mother that may hinder milk production and breastfeeding[5].

Premature NBs are considered the main recipients of human milk from the Human Milk Bank (HMB) because they have limitations to nourish themselves on the breast or because of health problems. However, they can receive donated milk from a donor breastfeeding mother or from their own mother (exclusive milk)[6]. The World Health Organization defines children born before 37 weeks of gestation as premature[7].

According to Resolution of the Collegiate Board (RDC) n. 171/2006, the donor should be a breastfeeding mother who has surplus milk, good health conditions and expresses the wish to donate her milk to other children in addition to breastfeeding her own[8]. Commonly, donor recruitment is carried out during the prenatal guidelines/encounters or even after delivery, within hospital environment, through the distribution of illustrative material with explanation about the advantages of breastfeeding and its management. [9]

This way, information about breastfeeding, its continuity and donation is passed in a positive way during the prenatal appointments in the Brazilian Public Health Network[10], and reinforced in the maternity wards of the Unified Health System (SUS) after birth[11].

Given the importance of lactation and breastfeeding and the unique benefits the newborn derives from HM, the objective of this study was to describe the epidemiological profile of donors and recipients of human milk in a reference HMB of a public teaching hospital in the State of Mato Grosso do Sul.

METHODS

This is a descriptive cross-sectional retrospective study developed with secondary data related to human milk donors and recipients.

The data were obtained from the Management System in Human Milk Bank and from the Medical and Statistics Archive Service of the Maria Aparecida Pedrossian School Hospital of the Federal University of Mato Grosso do Sul, in the city of Campo Grande, Mato Grosso do Sul State, Brazil.

The research was carried out between September and December 2018 after approval by the Research Ethics Committee of the Federal University of Mato Grosso do Sul under Protocol n. 2,866,363/2018.

The analysed period comprised January and December 2017 and the data collection occurred by means of a previously structured form. The sample included data from donors and recipients in the HMB System, and data from medical records of live new-borns who had been recipients of HM from the milk bank. Records that were incomplete in the System or in medical records were excluded. The variable weight of premature new-borns followed reference DATASUS) http://www.datasus.gov.br/cid10/V2008/WebHelp/definicoes.htm

For statistical analysis, spreadsheets were organized in Microsoft Excel (2017) submitted to descriptive statistical treatment by the Statistic Package for Social Sciences (SPSS) version 25.0, used to calculate measures of central tendency, mean and standard deviation. The Shapiro Wilk test was performed to determine the normal distribution with a significance level of 5%.

RESULTS

In 2017, 383 human milk donors, and a total of 614 L of HM were recorded. In terms of geographical distribution, 95.82% of donors were from Mato Grosso do Sul; 88.51% were resident in Campo Grande and 11.49% in other cities and towns in the State interior. As for work, 57.44% had no paid activity and declared themselves "homemakers". Of the 98.96% donors who were assisted in prenatal care, 79.63% did so in the public network (Table 1).

Table 1 - Characteristics of HM donors according to occupation, performance and location of prenatal care, donation condition and other variables, Campo Grande, MS, Brazil – 2017.

Characteristics		Frequency	%
City of residence	Campo Grande	339	88.51
	Other cities/towns	44	11.49
Place of origin	Mato Grosso do Sul	367	95.82
	Other states	16	4.18
Occupation	No paid activity	220	57.44
	Paid activity	163	42.56

Pre-natal	Yes	379	98.96
	No	4	1.04
Local of pre-natal	Public system	305	79.63
	Private system	74	19.32
	No assistance	04	1.05
Donation of blood received	No	379	98.96
	Yes	4	1.04
Condition of HM donation	Domiciliary	190	49.61
	HMB	156	40.73
	Exclusive	36	9.40
	Discharge	1	0.26
Smoking	No	379	98.96
	Yes	4	1.04
	Total	**383**	**100.00**

Source: HMB/School Hospital – 2017

When analyzing the donor weight parameters, the BMI showed an average of 24.35 ± 4.86 kg/m², with 63.74 ± 13.85 kg as weight before pregnancy, and 75.11 ± 14 , 25 kg at the end, with a total gain of 11.37 ± 6.11 kg. The average age of the recipient's mother was 27.45 ± 8.29 (Table 2).

Table 2 – Descriptive statistics of HM donors according to clinical variables in the reference milk bank, Campo Grande, MS, Brazil – 2017

Variable	**Mean**	**SD**
pregnancy age (in weeks)	37,71	3,56
Weight before pregnancy (kg)	63,74	13,85
Final pregnancy weight (kg)	75,11	14,25
Pregnancy weight gain	11,37	6,11

Source: HMB/School Hospital – 2017

Table 3 shows that the median age of the recipients' mothers was 27.00 (minimum 14 and maximum 46); 71.1% of infants (n=106) were premature; the median pregnancy age was 34.00 weeks (minimum 21.00 and maximum 42.00); and the median birth weight was 2225.00 grams (minimum 660.00 and maximum 5230.00). Also, 61.1% (n = 91) of the recipients weighed less than 2,500 grams, and were distributed in: Extreme Low Weight 0.7 (n = 1); Very Low Weight 11.4% (n = 17); Low Weight 49.0% (n = 73); and Normal Weight 38.9% (n = 58).

Table 3. Descriptive statistics of HM recipients according to gestational age and birth weight in   the referral milk bank, Campo Grande, MS, Brazil – 201

	Minimum	**Maximum**	**25%**	**Median**	**75%**	**IQR**	**CV**	**Value**
Mother´s age	14,00	46,00	20,00	27,00	34,00	14,00	30,21	< 0,001
Gestational	21,00	42,00	32,00	34,00	37,00	5,00	10,38	<

| **Weight** | 660,00 | 5230,00 | 1720,00 | 2225,00 | 2960,00 | 1240,00 | 34,27 | < 0.001 |

Source : Research   2018   IQR: Interquartile range; SD: Standard Deviation; CV: Coefficient of Variation; (1) Shapiro Wilks test to   check data normality

Table 4 reveals that 61.75% of recipients were male. As for place of origin, 66.44% were born in Campo Grande and 33.56%, in other cities or towns in Mato Grosso do Sul. The type of delivery   was surgical in 65.77% of cases and vaginal in 34.23% . Of the recipients, 93.88% were born to mothers who received prenatal care.

Table 4 - Profile of HM recipients according to gender, place of birth, type of delivery and prenatal care in the referral milk bank, Campo Grande, MS, Brazil – 2017

Characteristics		**Absolute frequency**	**%**
Gender	Masculine	92	61,75
	Feminine	56	37,58
	Indefinite	1	0,67
Place of origin	Campo Grande	99	66,44
	Other cities/towns	50	33,56
Type of delivery	Surgical	98	65,77
	Vaginal	51	34,23
Prenatal assistance	Yes	139	93,29
	No	10	6.71
	Total	**149**	**100,00**

Source: HMB/School Hospital – 2017

DISCUSSION

The 383 donors were responsible for approximately 614 liters of human milk that benefited 149 newborns in 2017. Of the donors, 57.44% had no paid activity and declared themselves "home-makers", with no professional activity, which may make the donation of HM easier. Some women reported difficult in donating milk because of lack of time, as they had to resume work after the maternity leave[12].

In the northeastern region of Brazil, 56.0% of donors who contributed to this practice "were homemakers"[13]. Women without employment are more likely to engage in exclusive breastfeeding in the first semester of their infant´s life and to continue breastfeeding them until they are 24 months old. This perspective also extends to the time span of HM donation, in the case of nursing mothers[14].

Regarding the donors´ geographic location, 95.82% were from Mato Grosso do Sul, 88.51% residing in Campo Grande, the state capital. It is believed that the geographic distribution contributed positively to the increase in donations, since most donors lived in Campo Grande.

The average age of the donors was 27.45 ± 8.29; a similar age range (30.28% ± 3.62 years) was found among the 28 donors interviewed in Viçosa, Minas Gerais State[15].

In our study, of the 98.96% donors who had prenatal care, 79.63% received support from the SUS. Prenatal care is the period for drawing donors and providing guidance on the benefits of breastfeeding and

the importance of spontaneous donation of surplus milk[16]. The decision process to become a donor will fundamentally depend on the assistance received, the form of communication performed, the valorization of autonomy and whether, in fact, the handling of milking was fully understood[17].

Regarding the donors' average BMI, a total gain of 11.37 ± 6.11 kg was recorded. On discussing this finding, it was observed that the donors surveyed obtained a weight gain within the recommended index. BMI is understood as weight in kilograms divided by height in square meters[18]. In pregnant women, the recommended weight gain is differentiated according to the nutritional condition in the pre-pregnancy period. Pregnant women who showed low weight need to have a weight gain of 12.5 to 18.0 kg; pregnant women of appropriate weight, from 11.5 to 16.0 kg; overweight pregnant women, from 7.0 to 11.0 kg; and obese pregnant women need to show weight gain less than or equal to 7.0 kg.

The BMI calculation performed on 1,117 puerperal women in Rio Grande do Sul showed that malnutrition in women at the beginning of pregnancy, or in those who presented insufficient weight gain, might leave them exposed to a higher risk of having newborns weighing less than 2,500g. BMI is a low-cost procedure that can be followed from the first consultation, with early nutritional intervention in order to reduce maternal-fetal risks[19].

As for the guidelines for donating human milk, the percentage of 49.61% refers to home collection, and 40.73%, to the HMB. Human milk collected at home was referred to as a facilitator for the donation process in Viçosa, Minas Gerais[15]. Another study carried out in Uberlândia, also in Minas Gerais State, in a HMB accredited to the Brazilian Network of Human Milk Banks, suggested that home milking is safe as long as the recommended hygienic-sanitary standards are followed[20]. The HMBs are part of Brazilian initiatives that integrate hospitals working in the maternal and child care of the SUS, as well as the private network existing in some Brazilian states, with the purpose of receiving human milk donated, processing it and guaranteeing the quality offered to premature, low weight or hospitalized newborns in the Neonatal Intensive Care Unit (NICU)[21]. Newborns (NBs) with allergies and those whose mothers have breastfeeding restrictions are also benefited; HM consumed safely protects them against the potential risks of substitute milk at an early age[22].

Of the 149 recipients, 106 were premature newborns with a median gestational age of 34.00 weeks (minimum 21.00 and maximum 42.00 weeks), and underweight (n = 91). These data corroborate RDC 171/2006, which lists prematurity and low weight among the special conditions of the recipient[8]. Donated human milk becomes essential for sick preterm or newborn babies, who, for various reasons, are unable to receive milk directly from their mothers[13].

Thus, a special diet adjusted to the conditions of prematurity is necessary to assist the HM recipient. They usually have no suction and swallowing reflexes and are usually unable to feed themselves orally1. Because of these problems, the recipient receives the milk, palatable and tolerable, that the HMB offers according to the stages of development and needs, in four classifications: colostrum (first seven days postpartum), transitional milk (7-14 days postpartum), mature milk (from 14 days postpartum) and special milk, produced by the nursing mother of premature babies (with gestational age less than 37 weeks) [23].

The delivery of the recipients was surgical in 65.77% (n = 98) of cases in the present study. A cross-sectional population-based study conducted in the city of Rio Grande (Rio Grande do Sul State) in 2007 estimated the prevalence of cesarean sections at 53.2%. The data found in these surveys confirm the rates

calculated for cesarean delivery in Brazil, placing the country in a prominent position in the world according to the Live Birth Information System (SINASC), when compared with the 15% recommended by the WHO[19].

There is still a lack of more consistent information on the determinants prior to and/or during the pregnancy of these women, whose outcome was deliveries with premature or low birth weight newborns, as observed in the 149 cases analyzed in the present study. The relevance of this study was to discover the sociodemographic profile of donors and recipients of HMB in Campo Grande/MS to optimize the process of attracting donors and consequently meeting the demand of recipients.

The limitations and the missing and incomplete information in the database made it difficult to analyze the clinical part of the donors and recipients, but did not hamper the identification of their epidemiological profile, which was the objective foreseen in the research.

It can be concluded that the 363 donors of human milk are young, and 79.63% had support from SUS for prenatal care. The contribution of the women who understood the importance of donation was effective: 614 liters of human milk were collected to nourish 91 RNs in premature condition with weight less than 2,500 grams[24].

It is recommended that, in the Human Milk Bank at issue, professionals systematically manage their database to allow more consistent assessments that may lead to the continuity of their social mission: to attract human milk donors and offer quality service to the recipients´ increasing demand.

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