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ORIGINAL ARTICLE

Impacts of the Coronavirus Pandemic on the Human Milk Bank of a Hospital in Porto Alegre, RS, Brazil

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Abstract

Introduction: To understand the impacts of the pandemic on the donation of breastmilk through an evaluation of the service flow in the hospitals milk bank during the pandemic as well as to verify whether or not parameters such as those of milk donations and conducted tests have varied during the pandemic. **Background:** A cross-sectional epidemiologic study was carried out through the comparison of the service flow and the volume of human milk collected by the milk bank between two periods (before and during the pandemic). The pre-pandemic period comprises the years between 2017 and 2019, whereas the pandemic period considered in this study stretches from March 1st 2020 to December 31st 2021. **Results:** The number of group appointments during the pandemic suffered a considerable decrease, with an average of 0,2 appointments and a standard deviation (SD) of ± 0,9 in comparison to the pre-pandemic period, during which there was an average of 31,1 appointments with a standard deviation of ± 13,6 (p<0,001). In relation to the volume of milk that was collected, there was significant decrease during the pandemic, with an average of 28,9 liters collected per month and a standard deviation of (DP) ± 11,9 in comparison to the pre-pandemic period, during which there was an average of 59,8 liters per month and a standard deviation of ± 29,2 (p<0,001). **Conclusion:** During the pandemic, there was a substantial decrease of donors and therefore of the volume of milk which was donated to the milk bank.

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INTRODUCTION

The World Health Organization (WHO) describes the Brazilian Human Milk Bank Network as the largest and most complex in the world. Almost three quarters (72.9%) of the 292 human milk banks in the world are located in Brazil. Between 2008 and 2014, the Network provided services to 11 million women, the equivalent to 88.5% of all women who sought human milk banks on Earth. They were supported by 1.1 million Brazilian breast milk donors, the equivalent to 93.2% of milk donors worldwide. Brazilian women donated 89.2% of the 1.1 million liters of breast milk collected worldwide and benefited 79.1% of the newborns taken to Human Milk Banks, making Brazil the country with the highest number of human milk donors in the world. According to the WHO, 170,000 children have benefited from human milk banks in Brazil in the last three years[1].

In addition to providing advice on breastfeeding, human milk banks also promote the collection of human milk for infants admitted to neonatal intensive care units. The milk from selected donors feeds mainly very low birth weight infants, protecting them from a variety of complications[2], as well as babies with congenital anomalies and neurological conditions[3].

Social isolation measures in effect during the COVID-19 pandemic placed breast milk donation to neonatal units at risk[4,5].

Breastfeeding and human milk donation recommendations now include additional infection prevention and control measures, such as the use of masks, hand hygiene, and cleaning of surfaces[6,7]. Recent research suggests that breast milk is not a route of vertical transmission of COVID-19[8]. Furthermore, antibodies against SARS-CoV-2 have been detected in breast milk, suggesting a potential protective benefit and reinforcing the need to maintain the collection of breast milk for neonatal units[9,10].

However, as the pandemic spread and hospital access rules became stricter, there was a fear that donor and recipient attendance to human milk banks would drop dramatically. This study sheds light on the impacts of the pandemic on the donation of breast milk resulting from changes in attendance to the human milk bank of the Santa Clara Hospital in Porto Alegre, RS, Brazil.

METHOD

Ethics

This study complied with the recommendations stipulated on Resolution 466/2012, which sets the guidelines for research with human beings, and was submitted to and approved by the Ethics Committee for Research with Human Beings at the Santo Antônio Children's Hospital.[11]

Study design

This is a cross-sectional epidemiological study.

Methodological procedures

Site of the study

The study was carried out at the Human Milk Bank of the Santa Clara Hospital in Porto Alegre, RS, Brazil. Data were extracted from records of milk bank attendees.

Data sources

The study included data from January 1, 2017 to December 31, 2021. The data of interest extracted from the records of the attendees were divided into two time periods, one before the pandemic (January 1, 2017 to February 28, 2020) and one during the pandemic (March 1, 2020 until December 31, 2021). Data were collected from the following sources: internal attendance sheets, tables containing the volumes of milk collected, and breast milk donor data.

Data from the hospital's milk bank included volumes of milk collected, number of previous live-born children, attendance to prenatal care, level of education, prescribed medications, pre-existing diseases, and medications used during pregnancy.

These records contain information about donors and newborns; lost milk and origin of milk; recipients; destination and volumes of donated milk. The variables of interest were recorded in a previously designed form for data collection. Data collection occurred in the months of May and June 2021.

Data collection and organization

Inclusion criteria

All breast milk donors who went to the milk bank in the period from January 1, 2017 to December 31, 2021 were included in the study.

Exclusion criteria

Donors who went to the milk bank outside the study period were excluded from, as were home-based milk donors.

Statistical analysis

Variables were described using means and standard deviations or medians and interquartile ranges, depending on the distribution of the data.

Student's t-student test for independent variables was used in the comparisons between means in different time periods. In cases of asymmetry, the Mann-Whitney test was used.

Data analysis

The data collected were compiled on a Microsoft Excel 2010 spreadsheet. Statistical analysis was performed on software package SPSS version 21.0. A significance level of 5% was adopted (p<0.05).

Risks and benefits

The study posed minimal risk to participants. No invasive procedures were performed, only data were analyzed.

The analysis of the impacts from the pandemic on milk bank attendance may serve as input in the development of actions and strategies designed to maintain the flow of milk donations despite the introduction of social distancing measures, in addition to raising awareness about the importance of milk donation programs and enhancing the commitment of milk donors.

RESULTS

During the pandemic, attendance to and the range of services provided by the milk bank decreased significantly. The number of group appointments during the pandemic dropped on average to 0.2 ± 0.9, compared to 31.1 ± 13.6 before the pandemic (p<0.001), as seen in Graph 1 and Table 1.

There was also a significant reduction in the average monthly volume of milk collected during the pandemic (28.9 ± 11.9 liters) compared to the period before the pandemic (59.8 ± 29.2 liters) (p<0.001).

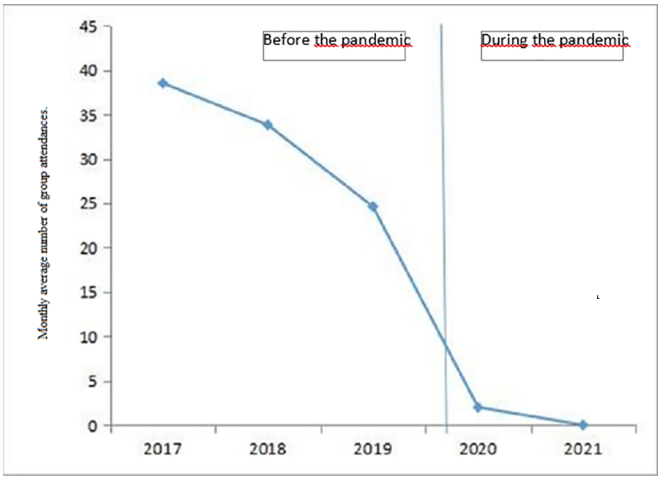
The volume of human milk distributed also decreased during the pandemic, although not significantly (Table 1).

The number of donors seen per month also decreased significantly during the pandemic, with a median (P 25 - P 75) of 16 donors (10 - 110) compared to 158 donors before the pandemic (131 - 201) (p<0.001), as shown in Graph 2 and Table 1.

The number of infants who received human milk increased significantly during the pandemic from a median of (P25 - P75) 172.5 (154.3 - 243.5) before the pandemic to 358 infants (308 - 457) during the pandemic period (p<0.001).

The number of microbiological tests performed on collected human milk did not decrease significantly during the pandemic compared to the period before the pandemic.

The number of analytical tests performed on milk samples, such as crematocrit, decreased significantly during the pandemic from an average of 63.8 ± 21.1 to 33.7 ± 11.9 (p<0.001), as seen in Table 1 and Graph 3.



Graph 1. Average number of monthly group appointments per year.

Nearly every parameter decreased significantly when pre-pandemic (January1, 2017 to February 28, 2020) and pandemic (March 1, 2020 to December 31, 2021) numbers were compared, except for the number of individual appointments and microbiological tests, which decreased but not significantly. The number of infants receiving donor milk increased significantly.

DISCUSSION

On March 11, 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a global pandemic[12-14].The pandemic has introduced numerous challenges in many areas, and exposed the vulnerabilities in the delivery of services and emergency preparedness of human milk banks. For the first time, the global human milk banking community is coming together to share the lessons learned, collaborate, and plan for future action. On March 17, 2020, a Virtual Communications Network of milk bank leaders assembled for the first time to discuss the efforts needed during the pandemic. Today, this Network has more than 80 members from 34 countries[11,15].

Data collected from regional and national leaders in the Virtual Communication Network show that more than 800,000 infants are expected to receive donor milk worldwide annually. The group has discussed the specific challenges of COVID-19 and developed mitigation strategies to ensure the safety of donor milk and the continuity of human milk bank services[15]. During the pandemic, human milk banks faced many logistical challenges in areas such as adequate staffing, donor recruitment, safe handling and transportation of donor milk, and increased demand as a result of the separation of mothers and infants[16]. In the present study, although a reduction in the number of donors and the volume of donor milk was observed, the number of infants receiving donor milk increased significantly during the pandemic compared to previous years, possibly due to staff awareness regarding the importance of offering human milk to hospitalized infants during the pandemic.

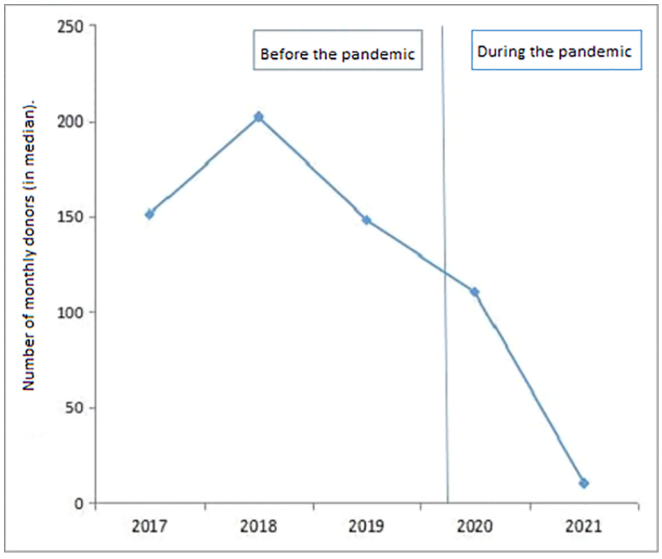
We also found that the number of monthly donors decreased significantly during the pandemic, compared to the time period before it. This was possibly due to the fear donors had of going to the milk bank during the pandemic, although the number of hospitalized infants in need of milk increased.

Strengthening human milk banking systems is necessary to ensure a safe supply of donor milk, a key component in early newborn care in routine or emergency settings, including natural disasters and pandemics[17,18]. Human milk banks are a necessary but chronically under-funded service that deserves better protection against current and future emergencies[19], particularly since during the pandemic mothers suspected with COVID-19 were advised not to discontinue breastfeeding while biosafety measures were taken to avoid transmission of the disease to their newborns[20].

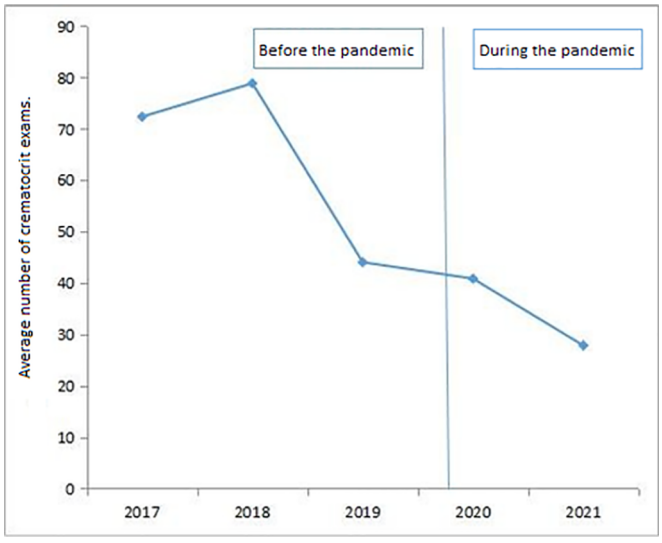
Table 1. Milk bank activity before and during the pandemic.

Variables	Before the pandemic (n=38)	During the pandemic (n=22)	*P*
Group appointments – mean ± SD	31.1 ± 13.6	0.2 ± 0.9	<0.001
Individual appointments – mean ± SD	909.7 ± 135.3	841.1 ± 165.4	0.087
Leite humano coletado (l) – média (SD) ± DP	59.8 ± 29.2	28.9 ± 11.9	<0.001
Distributed milk volume (l) – mean ± SD	37.0 ± 11.6	30.1 ± 8.6	0.017
Number of donors – median (IQR) (P25 – P75)	158 (131 – 201)	16 (10 – 110)	<0.001
Number of recipients – median (IQR) (P25 – P75)	172.5 (154.3 – 243.5)	358 (308 – 457)	<0.001
Number of tests microbiological – mean ± DP	162.1 ± 46.0	126.7 ± 37.4	0.003
Number of tests crematocrit – mean ± DP	63.8 ± 21.1	33.7 ± 11.9	<0.001
Number of Dornic Acidity tests – mean ± SD	64.4 ± 21.3	34.4 ± 12.3	<0.001

Comparison of milk bank activity before and during the pandemic. The pre-pandemic period covers the years 2017, 2018 and 2019; the pandemic period ranged from March 1, 2020 to December 31, 2021.



Graph 2. Average number of monthly group appointments per year.



Graph 3. Mean number of crematocrit tests performed a month.

Human milk banks are a strategic element in public policy for breastfeeding. The recent pandemic considerably affected human milk banks and jeopardized the care of healthy mothers and infants. The impact from the decreases in human milk donation may have been even greater in hospitalized preterm infants, especially since human milk decreases neonatal mortality and occurrence of sepsis and enterocolitis compared to the formula[21].

CONCLUSION

The Human Milk Bank of the Santa Casa de Porto Alegre was directly affected by the pandemic and saw considerable decreases in the number of donors and the volume of donor milk compared to the time period before the pandemic. Human milk decreases the incidence of sepsis and enterocolitis in extremely preterm infants. Supply shortages seen during the pandemic may have been particularly harsh on this group of patients.

This topic requires constant attention and updates based on the studies about COVID-19 and donor breast milk in human milk banks.

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