


Prevalence of breastfeeding and its obstacles in patients with CHD in southern Brazil

Maíra Ribas Goulart¹ , Julia Lima², Marcelo Ahlert², Sandra Barbiero¹, Daniela Schneid Schuh¹ and Lucia Pellanda²

Original Article

Cite this article: Ribas Goulart M, Lima J, Ahlert M, Barbiero S, Schneid Schuh D, and Pellanda L (2020) Prevalence of breastfeeding and its obstacles in patients with CHD in southern Brazil. *Cardiology in the Young* 30: 1417–1421. doi: [10.1017/S1047951120002115](https://doi.org/10.1017/S1047951120002115)

Received: 28 April 2020
Revised: 15 June 2020
Accepted: 30 June 2020
First published online: 24 July 2020

Keywords:

Breastfeeding; child; CHDs

Author for correspondence:

Maíra Ribas Goulart, Instituto de Cardiologia/
Fundação Universitária de Cardiologia, Avenida
Princesa Isabel, 395, Bairro Santana,
Porto Alegre, CEP: 90040-371, RS, Brazil.
Tel: +55 51 3230 3757; Fax: +55 51 32303877.
E-mail: mairaribas.nutri@gmail.com

¹Graduate Program, Institute of Cardiology of Porto Alegre, University Foundation of Cardiology, Porto Alegre, RS, Brazil and ²Federal University of Health Sciences of Porto Alegre, Porto Alegre, RS, Brazil

Abstract

Introduction: Breast milk is nutritionally adequate and is related to the reduction of various health problems in childhood. Its offer is widely recommended in health guidelines. **Objective:** To estimate the prevalence and obstacles to breastfeeding in patients with CHD in southern Brazil. **Methods:** Cross-sectional study of patients with CHD between 2 and 18 years of age. Patients with genetic syndromes and patients whose mothers had died were excluded from the analysis. The variables on breastfeeding in the first 2 years of life were collected through a phone call to the mothers, which was conducted by trained evaluators. Prevalence was described in proportions and the continuous variables as means and standard deviation. Bivariate analyses were evaluated using a chi-square test to measure the association between the variables and the outcome. **Results:** A total of 351 patients with CHD were analysed. There was a predominance of males (53%) and a mean age of 9.54 ± 4.52 years. Breastfeeding up to the sixth month was present in 40% of the cases. **Conclusion:** The mothers of babies with CHD face great challenges to maintain the supply of breast milk, whether inherent to the practice of breastfeeding or related to CHD.

Breastfeeding is a bonding and protection strategy for the baby and is related to the reduction of infant morbidity and mortality, reduction of respiratory problems and reduction of diarrhoea cases.^{1–3} Breast milk composition is nutritionally suitable, as it provides all the nutrients necessary for the human infant.⁴ Breast milk is recommended as the infant's sole source of nutrition for the first 6 months of life and it shall be maintained until 24 months of life.⁵

Although breastfeeding brings numerous benefits, it is not carried out comprehensively. In low- and middle-income countries, about 36.6 million (63%) of children with less than 6 months of life were not exclusively breastfed.⁶ In Brazil, there was an upward curve in the prevalence of exclusive breastfeeding and breastfeeding between 1980 and 2006, but until 2013, there was a slight decline in practice.⁷ When 6 months of life was completed, only 4% of the infants in the sample received exclusively breast milk.⁸

Breast milk is the preferential food for all babies, being healthy, sick or premature.⁹ However, several variables may affect the onset and maintenance of breast milk in infants with CHD, including severity of the lesion, need for mechanical ventilation or early surgical procedures, dyspnoea and heart failure, as well as psychological and social factors.¹⁰ It is well known that, in this population, there are lower rates of breast milk intake compared to healthy infants.¹¹ However, the data on prevalence and the causes of difficulties for the practice of breastfeeding in this population are scarce and performed in small samples.^{11,12}

These data are fundamental for the planning of interventions aimed at increasing the practice of breastfeeding in babies with serious diseases because despite the difficulties, the benefits of breast milk in this group are significant. Therefore, the objective of this study is to identify the prevalence of breastfeeding and the difficulties to perform this practice in patients with CHD in southern Brazil.

Patient and methods

This is a cross-sectional study conducted with congenital cardiac patients treated at a paediatric outpatient clinic of a reference hospital for cardiology in Rio Grande do Sul.

Patients between 2 and 18 years of age diagnosed with CHD were included. Patients with genetic syndromes and patients whose mothers had died were excluded from the analysis. During the course of the research, it was noticed that only the mothers were able to respond completely to the data on breastfeeding and food introduction. In order to avoid incomplete data that would hinder the analysis, it was decided to exclude patients whose mothers had died.

The variables related to breastfeeding in the first 2 years of life were collected through a telephone call to the mothers, performed by trained evaluators, between October 2017 and November 2018.

The questionnaire was structured by the author based on the following variables: breastfeeding profile: received guidance on breastfeeding soon after giving birth (yes/no), self-declared colour or race of the patient (white, black or brown), gestational age (term/premature), maternal age (at the time of evaluation), patient's age, birth weight (categorised as low weight and adequate); intake of other types of milk: infant formula, cow's milk, two types or more, others and did not receive; the main reason for suspending/not receiving breastfeeding: problems related to CHD (tiredness or not having the strength to suck, hospitalisation, surgery); maternal problems (health problems, new pregnancy, mother did not want to breastfeed); baby did not want any more; mother had no milk/milk dried; mother returned to work; infant's age; medical advice; other.

The duration of breastfeeding after the collection was categorised as: not receiving, breastfeeding up to 6 months, breastfeeding for more than 6 months to 12 months, greater than 12 months to 24 months and breastfeeding for more than 24 months. The duration of exclusive breastfeeding was categorised as: did not receive, up to 3 months, between 4 and 6 months and greater than 7 months. Definitions of exclusive breastfeeding and breastfeeding were used according to the World Health Organization 2007.¹³

The sample was calculated considering a 97% confidence interval with a prevalence of breastfeeding among infants less than 24 months of 52%¹⁴ and a margin of error of 6%. A 97% confidence interval was chosen so that it was possible to include a larger number of patients in the study. Thus, a sample of 303 individuals was calculated, added 15% for possible losses, with the final sample with 349 patients. Epiinfo software version 7.2.2.6 was used for data analysis.

Prevalence was described in the form of proportions, continuous variables were described as means and standard deviation and bivariate analyses were evaluated using a chi-square test to measure the association between the variables and the outcome. Data were collected from the REDCap online platform and analysed in the SPSS version 20.0 programme.

All those in charge involved signed the Informed Consent Form, and the project was approved by the Research Ethics Committee of the Institution under no. 2245336.

Results

A total of 351 patients with CHD were analysed. There was a predominance of males with 188 (53.6%) patients. The mean age of the patients at the time of collection was of 9.54 ± 4.52 years. Regarding maternal age, the average was 37.72 ± 8.61 years for the colour or race variable, 327 patients were analysed: 280 (79.7%) whites, 37 (10.4%) blacks and 10 (3.1%) browns.

Gestational age was evaluated in 350 patients, 288 (82%) were born at term. Regarding birth weight, the mean birth weight was 3112 ± 664 g ($n = 327$), where the majority 276 (83.4%) was born with proper weight.

Table 1 presents the primary diagnosis of CHD.

Regarding the offer of exclusive breastfeeding, the median in this study was 2 months. Among the 351 patients analysed, the percentage of individuals who had never received breast milk exclusively was 31% ($n = 109$) and the percentage of individuals who had received up to the third month of life was 34.5% ($n = 121$).

Table 1. Primary diagnosis of CHD

CHD	n = 351	%
Interventricular communication	66	19.0
Interatrial communication	64	18.2
Tetralogy of Fallot	49	14.0
Pulmonary stenosis	31	8.8
Coarctation of the aorta	22	6.3
Persistence of the arterial channel	19	5.4
Bicuspid aortic valve	11	3.1
Aortic stenosis	13	3.8
Atrioventricular septal defect	11	3.1
Sub aortic ring	8	2.3
Transposition of large vessels	9	2.7
Double outlet right ventricle	6	1.7
Tricuspid atresia	6	1.7
Aortic insufficiency	5	1.4
Patent oval foramen	4	1.1
Pulmonary atresia	4	1.1
Ebstein anomaly	3	0.8
Mitral insufficiency	4	1.1
Mitral valve prolapse	2	0.6
Tricuspid insufficiency	2	0.6
Truncus	2	0.3
Dilated cardiomyopathy	1	0.3
Hemitruncus	1	0.3
Dextrocardia	1	0.3
Univentricular	1	0.3
Other	6	1.7
Total	351	100

In the sixth month of life, only 15.7% ($n = 55$) of the sample received exclusive breastfeeding.

Breastfeeding, performed in a non-exclusive manner, had a median of 5 months. The percentage of the sample of those who had never received breastfeeding was 18.2% ($n = 64$), those who received until the sixth month of life was 40.7% ($n = 143$) and those of up to 12 months 13.4% ($n = 47$). The percentage of babies who were breastfed up to 24 months of life or more totalled 27.6% ($n = 97$), and 16.6% ($n = 58$) of these children were breastfed for more than 24 months.

The suspension of breastfeeding allows the ingestion of other types of milk. The milk most offered in the impossibility of breastfeeding was cow's milk with a prevalence of 43.7% ($n = 152$) followed by 21.8% ($n = 76$) of infant formula. Children who had never received milk other than breast milk totalled 9.8% ($n = 34$).

The main reason for mothers to suspend breastfeeding was problems related to CHD, whose prevalence was 25.3% ($n = 89$), followed by mother had no milk or dried milk with 23.4% ($n = 82$). Other reasons include: baby did not want any more with 13% ($n = 46$), maternal problems with 12.5% ($n = 44$), infant age 11% ($n = 39$) and other reasons 14.5% ($n = 51$).

The problems related to CHD were the main reasons for the babies never having received exclusive breastfeeding (p-value < 0.000). Receiving exclusive breastfeeding only until the third month of life was related to the reason mother had no milk or dried milk (p-value 0.007). The other reasons were not significantly related to exclusive breastfeeding time.

Discussion

The main contribution of this study was to be one of the pioneers in Brazil to approach the prevalence of breast milk intake in a large sample of patients with CHD.

Breast milk provides all the nutrients necessary for the human infant to have a healthy development in the first month after birth.^{4,15} Therefore, its offer is recommended exclusively until the sixth month of life.⁵ Although exclusive breastfeeding has a positive impact on the health of the infant, the prevalence of exclusive breastfeeding in the present study was 15% of the sample at 6 months of age and the median was 2 months. Data on breastfeeding in infants with CHD in Brazil are scarce. In northeastern Brazil, a prevalence of exclusive breastfeeding was reported in 11.9% in a sample of 132 children with CHD.¹⁶ When we compared these data with the southeast region, there was an increase in the number of children exclusively breastfed in the sixth month of life, as Gaspareto et al. describes a prevalence of 26.9% of exclusive breastfeeding in a sample of 67 children with CHD.¹²

Exclusive breastfeeding in children with CHD has not yet been described in detail in the literature. We observed that in Brazil, there is great variability between the findings and the samples are small. When analysing worldwide data on exclusive breastfeeding in patients with CHD, we also observed low prevalence in other countries. In North America, for example, Macías et al., in their descriptive study, highlight that the frequency and duration of breastfeeding in patients with CHD, during the first 6 months of life, was of only 7%.¹⁷

Several difficulties related to CHD may reflect on the low prevalence of exclusive breastfeeding in this population. However, if we compare these data with healthy Brazilian babies, there are important similarities. In Brazil, in 2009, 34,366 healthy Brazilian children were analysed, all with less than 6 months, where the mean time of exclusive breastfeeding was 1.8 months and the prevalence ranged from 37% in the northeast region of the country to 45% in the Midwest.^{18,19} A little over 10 years of this research, a recent study with more than 500 Brazilian infants showed that, at 6 months of life, only 4% of infants have received exclusive breastfeeding.⁸ We observed that regardless of having a CHD, more than 50% of the Brazilian children included in these studies did not follow the worldwide recommendations for exclusive breastfeeding until the 6 months of life.

Some determinants may explain this finding in both healthy babies and babies with CHD. In Brazil, women are taking up more and more space in the labour market and this could contribute to the decrease in free time for women to breastfeed. Consequently, other foods have to be introduced on early stages of the child's feeding. In 2015, the total hours worked by women (paid work and unpaid work in household chores) were 62 hours/week.^{20,21} One study showed that the frequency of exclusive breastfeeding in children of women who did not work was twice as high as those whose mothers who had some occupational activity that made them stay away from home.²²

It is known that exclusive breastfeeding is a challenge for both mothers of babies with CHD and mothers of healthy babies and the

recommendation is that children be breastfed up to 24 months of life or more.⁵ When analysing the duration of breastfeeding in a non-exclusive way in the present study, we observed that 18% of the children evaluated never received breast milk. And when comparing breastfeeding and age, we observed that there is a decline up to 12 months of life, but the prevalence increases when reaching 24 months of life or more. Up to 6 months of life, 40% of the children were breastfed in a non-exclusive way. Our finding is similar to the result described by Gaspareto et al. who in their study highlighted that 38% of the Brazilian children with CHD evaluated remained in breastfeeding until 6 months of age.¹² In the literature, the prevalence of breastfeeding in children with CHD ranged from 9.9 to 24%.¹⁷ However, the evaluated studies present small samples, which makes it difficult to accurately compare and generalise the data. However, we can infer that at 6 months of age, more Brazilian children with CHD are in breastfeeding compared to children in other countries.

When we evaluated the prevalence of breastfeeding at 24 months of life or more, there is an important reduction in the number of breastfed children, only 27% received breast milk in this period. If we compare these findings with healthy Brazilian babies, we observed that the percentage of children breastfed in the first 24 months of life was 25% between 1986 and 2006, and 31.8% in 2013.⁷ Although mothers of babies with CHD face obstacles to breastfeed^{23,24} in Brazil, the prevalence of breastfeeding in this population is similar to that of healthy babies.

When the breastfeeding duration data in infants older than 24 months are analysed in isolation, the results were unexpected. It is observed that about 16% of patients received breast milk after this age group. No data similar to this were found in the literature, so it is possible to be hypothesised that there is a combination of factors in CHD.

In some cases, the child needs to undergo a surgical procedure and, therefore, we believe that the process of food introduction may be impaired in the postoperative recovery phase. Therefore, the supply of breast milk becomes predominant due to a possible better acceptance.

Parents may also be concerned about the offer of new food to their "sick" and "weakened" child. There are reports in the literature that demonstrate that many parents remain with the image of a sick child, whose is in a life-threatening situation, even after cardiac corrections.^{17,25} We emphasise that there is no age limit for the mother to breastfeed and that the practice should be performed as long as it is beneficial for the mother and the child. However, it should be ensured that complementary feeding is done, at appropriate time, and that breast milk does not replace meals in older children.

The results found in the present study on the time of exclusive breastfeeding and breastfeeding in children with CHD show us that, although the prevalence is similar to the prevalence of breastfeeding in healthy Brazilian babies, breast milk intake is considered low in this sample.

These findings may be a reflection of the numerous obstacles encountered by patients with CHD. According to a qualitative study, parents of infants with CHD reported that the main challenges encountered at the time of feeding them are: prolonged time to eat, low milk intake and frequent tiredness.²⁶ Feeding difficulties are among the main factors that trigger stress in the parents of patients with CHD.²⁷ Our results corroborate the data of difficulties described in the literature, since the main reason claimed by the mothers of this study for the interruption or non-supply of breast milk to babies was the presence of problems related to heart

disease. This category included difficulties for the baby to suck the breast, tiredness during breastfeeding, hospitalisations and surgeries.

Although problematic feeding in infants with CHD were reported,²⁸ the supply of breast milk should not be discouraged. Full engagement and awareness on the importance of breast milk should be better developed at all health centres specialised in CHD. Barbas et al. presented the comparison of data before and after the implementation of an education programme in breastfeeding for mothers of infants with CHD.²⁹ The mothers had access to appropriate material and place for breast milk extraction. The result was an increase in the prevalence of breast milk intake and increased motivation for mothers to maintain lactation, as well as greater satisfaction with the support team. Such findings suggest that, given the support and the education needed to initiate and maintain lactation, mothers can successfully breastfeed their babies with CHD for the recommended length of time.

A prevalent reason for discontinuation of breastfeeding was that the mother had no milk or that the milk dried. This was also the main factor reported for the suspension of exclusive breastfeeding at 3 months of age. It is known that, with few exceptions, women undergo challenging physiological conditions to produce milk in an adequate amount for the baby and that the increase in production depends mainly on breast emptying.³⁰

Psychosocial factors such as anxiety, stress and insecurity can also negatively affect the maintenance of breastfeeding.¹⁸ They may be related to poor breast milk production³¹ and early discontinuation of breastfeeding.³² In families of CHD infants, stressors are present and mainly related to feeding practice.^{26,27}

There are numerous factors that influence the non-compliance with the recommended practice or the premature suspension of breastfeeding.³³ According to Escobar et al., in a study conducted with healthy children and their companions at the Emergency Room service of the Children's Institute (PSICr) of Hospital das Clínicas, a public hospital in the city of São Paulo, SP, Brazil, mothers predominantly know that breastfeeding is important and that it brings benefits to the baby's life, but almost 40% of them report subjective reasons for suspending it, such as weak milk, refusal of the child or that the milk has dried.³⁴

Among the limitations of this study, we have the memory issue and characteristic of retrospective studies and, therefore, the time of breastfeeding and exclusive breastfeeding was collected in months and not in days, in order to try to minimise this bias. There was also the bias of selection, since only patients treated in a single specialised care location were interviewed. However, because it is a reference hospital in cardiology, patients from several cities in southern Brazil are seen there, which could minimise the effects of this bias.

Regardless of the severity of the injury, infants with CHD should be encouraged to ingest breast milk. It is therefore the responsibility of the health team to guide the mothers throughout the breastfeeding process, before and after giving birth, to provide adequate materials for milk extraction, when necessary, and to provide a close and attentive care, for this is a stressful period for both the mother and the baby.

Conclusion

Although breastfeeding is recommended worldwide, and its benefits are widely disseminated, the prevalence of breastfeeding in patients with CHD is low and factors related to CHD were the most associated with the decreased practice.

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