



ORIGINAL ARTICLE

CARDIOPATIAS CONGÊNTAS: ALIMENTAÇÃO COM LEITE HUMANO EM UM HOSPITAL CARDIOLÓGICO

CONGENITAL HEART DEFECTS: FEEDING WITH HUMAN MILK IN A CARDIOLOGY HOSPITAL

ENFERMEDADES CONGÉNITAS DEL CORAZÓN: ALIMENTACIÓN CON LECHE MATERNA EN UN HOSPITAL CARDIOLÓGICO

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ABSTRACT

Objective: to describe the profile of newborns and infants fed with human milk from a milk collection station of a cardiology hospital. **Method:** This is a quantitative, descriptive, cross-sectional study that used medical records of newborns and infants who received exclusively human milk up to the age of six months and continued to be fed with it for up to a year. The sample was composed by 32 medical records, with data collected through a script built by the researchers, using the descriptive statistical analysis. **Results:** It is reported that infants composed 22 (68.8%) of the sample; the male gender was prevalent in 18 (56.0%); mean age was 96 days; mean birth weight was 3.080g; 17 (50.0%) presented income above seven minimum wages; the average length of stay in the ICU was 9.5 days and the average length of infirmity was six days; of the 18 complications found, the most frequent was abdominal distention 11(61.1%) and the defects with higher incidence were Tetralogy of Fallot and Aortic Coarctation, with five (15.7%) each. **Conclusion:** It is concluded that the profile of children who received exclusively human milk was characterized and few studies have brought the impact of breastfeeding on children with heart defects. Clinical protocols can be improved.

Descriptors: Congenital heart defects; Breastfeeding; Human Milk; Milk Banks; Cardiovascular Nursing; Infant Nutrition.

RESUMO

Objetivo: descrever o perfil de recém-nascidos e lactentes alimentados com leite humano de um posto de coleta de leite de um hospital cardiológico. **Método:** trata-se de um estudo quantitativo, descritivo, transversal que utilizou prontuários de recém-nascidos e lactentes que receberam exclusivamente leite humano até os seis meses e que continuaram a ser alimentados com ele até um ano. Compôs-se a amostra por 32 prontuários, com dados coletados por meio de roteiro construído pelas pesquisadoras, utilizando-se a análise estatística descritiva. **Resultados:** informa-se que os lactentes compuseram 22 (68,8%) da amostra; o sexo masculino foi prevalente em 18

(56,0%); a idade média foi de 96 dias; o peso médio ao nascer foi de 3.080g; 17 (50,0%) apresentaram renda acima de sete salários-mínimos; o tempo de permanência médio na UTI foi de 9,5 dias e de enfermaria foi de seis dias; das 18 complicações encontradas, a mais frequente foi a distensão abdominal 11(61,1%) e as doenças de maior incidência foram Tetralogia de Fallot e Coarctação de Aorta, com cinco (15,7%) cada. **Conclusão:** conclui-se que o perfil de crianças que receberam exclusivamente leite humano foi caracterizado e poucos estudos trouxeram o impacto da amamentação em crianças com cardiopatias. Podem-se aprimorar os protocolos clínicos. **Descritores:** Cardiopatias Congênitas; Aleitamento Materno; Leite Humano; Bancos de Leite; Enfermagem Cardiovascular; Nutrição do Lactente.

RESUMEN

Objetivo: describir el perfil de recién nacidos y lactantes alimentados con leche materna en una estación de recogida de leche en un hospital de cardiología. **Método:** se trata de un estudio cuantitativo, descriptivo, transversal que utilizó historias clínicas de recién nacidos y lactantes que recibieron exclusivamente leche materna hasta los seis meses y que continuaron siendo alimentados con ella hasta un año. La muestra estuvo compuesta por 32 historias clínicas, con datos recolectados a través de un guion construido por los investigadores, mediante análisis estadístico descriptivo. **Resultados:** se reporta que los lactantes constituyeron 22 (68,8%) de la muestra; el sexo masculino predominó en 18 (56,0%); la edad promedio fue de 96 días; el peso promedio al nacer fue de 3.080 g; 17 (50,0%) tenían ingresos superiores a siete salarios mínimos; la estancia promedio en la UCI fue de 9,5 días y en la sala de 6 días; de las 18 complicaciones encontradas, la más frecuente fue la distensión abdominal 11 (61,1%) y las enfermedades más prevalentes fueron la Tetralogía de Fallot y la Coartación Aórtica, con cinco (15,7%) cada una. **Conclusión:** se concluye que se caracterizó el perfil de los niños que recibieron exclusivamente leche materna y pocos estudios han demostrado el impacto de la lactancia materna en los niños con cardiopatía. Se pueden mejorar los protocolos clínicos.

Descriptores: Cardiopatías Congénitas; Lactancia Materna; Leche Humana; Bancos de Leche; Enfermería Cardiovascular; Nutrición del Lactante.

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INTRODUCTION

Congenital heart defects (CHD) are defined as a structural and/or functional malformation of the heart that is present from the moment of birth, resulting in hemodynamic and clinical impairment to the carrier.¹ They can be divided into two types: acyanogenic, when there is no mixture in the systemic circulation of oxygenated and non-oxygenated fractions, and cyanogenic, in which this mixture occurs.¹ It is added that CHD is responsible for a significant part of neonatal mortality and could be reduced if specialized care were instituted from the gestational period until the birth of the child with the support of a team specialized in fetal cardiology.²

It is known that CHDs affect about 28,846 new cases per year and it is believed that this number is lower than the reality, since they are often underdiagnosed. It is warned that the incidence of congenital malformations of the circulatory system has increased over the years. In 2009, 1287 cases per 100,000 live births were reported, and in 2013, this number reached 8687 cases per 100,000 live births, with predominance in the Southeast region.³

Among the care to be taken with those born with this malformation is the ingestion of human milk. Breastfeeding is recommended by the World Health Organization (WHO) as an essential food practice for the development of the newborn baby, emphasizing that breast milk should be exclusive until the sixth month of life and, in a complementary way, it is recommended to maintain breastfeeding until the second year or more.⁴ Exclusive breastfeeding is characterized when the newborn and infant receive human milk directly from the breast or milked and/or from the donation of another nurse, being this human milk properly pasteurized, which can also be from the mother herself, without adding any other liquids or solids.⁴⁻⁶

It is understood that the promotion, protection and support of breastfeeding is a fundamental role of the health professional, who is one of the facilitators in supporting the nutritionist. In this perspective, the health professional needs skills and knowledge regarding technical, cultural, social and emotional aspects in the individualization of the assistance.⁴⁻⁶ It should be stressed that the competencies of health professionals related to breastfeeding should not be restricted only to prenatal care or in areas of basic care, since health professionals should be prepared to care for nursing mothers at all levels of health care, such as in hospitals.

In this way, the existence of human milk collection stations is informed as support for babies and health professionals in this context. This is characterized as a unit technically linked to a milk

bank, and may be a fixed or mobile unit, intra or extra-hospital. It is also responsible for the collection of milked milk and its adequate storage, as well as for actions to promote, protect and support breastfeeding.⁷ It is recorded that the baby with CHD may not suck or present inadequate suction, which compromises its nutrition and, sometimes, is hospitalized in the Intensive Care Unit (ICU). It is believed that, in this way, the milk collection station is a stimulus that maintains the milk production of the nurse when there is a need to separate the mother and baby.⁷

It becomes a fact that this population can show clinical characteristics that make oral breastfeeding difficult, direct to the breast or bottle in several situations, so it needs the help of specialized health professionals, who indicate about the ways of feeding, ways of handling these babies and, therefore, the work of an experienced team in CHD, with individualized assessment of each case, is essential.⁸

The nutritional monitoring of congenital cardiopaths is one of their objectives, the detection of the specific caloric needs of each one and ways of offering human milk orally, feeding by gavage, enteral probes or gastrostomies, with the objective of conserving the baby's caloric energy.⁹ It is known that there are reports of breastfeeding mothers who highlight the actions of professionals who, by performing an inadequate approach, or lack of it, led them to discourage them from maintaining milk milking, failing to provide breastfeeding to the congenital cardiopath, thus emphasizing the importance of the specialized professional's performance with this public.⁹

It is observed that there are several and indisputable advantages in relation to the use of human milk for the nutrition of any baby and, in the case of people with CHD, they can benefit even more from this practice, because they often undergo heart surgery and have fragilities in the immune system during treatment. Breastfeeding can improve your digestive process, because the supply of human milk ensures greater frequency of feeding, even if in lower volume at each feed, without great effort and tiredness of the carrier of CHD and, when possible, the direct management in the breast will ensure the gain and maintenance of weight, in addition to immunological properties and the bond of the mother-baby binomial.

OBJECTIVE

To describe the profile of newborns and infants fed with human milk from a milk collection station of a cardiology hospital.

METHOD

This is a quantitative, descriptive, cross-sectional study carried out at a milk collection station of a philanthropic institution specialized in cardiology in the city of São Paulo. The collection station provides about 400 consultations per month, with an average milking of 20 liters/month of human

milk of, on average, 13 newborn and/or infant mothers, and, on average, the same number of children attended by the milk collection station.

The study sample was for convenience, and the following inclusion criteria were considered: medical records of newborns and infants up to one year of age, carriers of congenital heart defects, born or not in the institution, who were attended and received exclusive human milk up to six months and continued receiving it until one year of age at the collection station, from January 2017 to January 2019. It was excluded the medical records whose babies received milk formula during this period, those that had incomplete medical records and those that evolved to death.

The project was submitted to the Ethics in Research with Human Beings Committee of the Heart Hospital, with the CAAE 13189019.0.0000.0060, being approved under the Parecer nº 3.323.070/2019. After the approval, the records of the nursing mothers were collected and then the babies who received human milk from the collection station in the institution were identified, and the medical records were analyzed from July 2019 to September 2019.

The data was collected through a script prepared by the researchers containing sociodemographic information (age, sex, place of residence, age of the mother, family income); characteristics of hospital care (date of hospitalization, evolution of birth weight and follow-up); types of congenital malformation of the circulatory system; type of surgery performed; length of hospitalization; health complications that occurred in the period and time in which they received human milk exclusively; amount of milk received; length of time in which human milk was offered and ways in which it was received. After the collection, the data were transcribed into an Excel® spreadsheet, submitting them to descriptive statistical analysis.

RESULTS

Included were 32 medical records of children with congenital heart defects who received human milk. The sample presented a mean age of 96 days, consisting of ten (31.2%) newborns and 22 (68.8%) infants and, of the children included, 18 (56.0%) were male and 14 (44.0%) female and the mean age of mothers was 35.33 ± 4.39 years. It was observed, over the familiar income, that seven (21.9%) received from one to three minimum wages; nine (28.1%) received from four to six minimum wages and 16 (50,0%) received more than seven minimum wages.

The mean weight at birth was 3080 ± 493 g, with a mean in the evolution of the period of hospitalization of 4516 ± 1980 g, with a minimum weight of 927g and a maximum weight of 9420g. The length of stay varied among the babies who were admitted to the ICU and to the Admission Unit (AU), and those who were admitted to the ICU had a higher number of days (2-32 days), which is justified by the need for post-surgical recovery. In addition, there were 18 complications such as

abdominal distension in 11 cases (61.1%), vomiting in six (33.3%) and diarrhea in one (5.6%), but none of these complications prevented the supply of human milk directly.

Table 1 shows the relation of weight at birth, weight at discharge, length of stay, average received of breast milk, fasting time (due to procedures) and introduction of complementary feeding after six months of the children included in the study. It should be noted that it was not possible to account for the volume of milk received by the children who directly received human milk through the mother's breast.

Table 1. Relation per child of birth weight, evolution of weight, period of hospitalization, volume of human milk* received, fasting, and complementary feeding at Hospital do Coração, from January 2017 to January 2019. São Paulo (SP), Brazil, 2019.

N	Weight at birth (g)	Weight at discharge (g)	Hospitalization ICU (days)	Hospitalization AU (days)	Average volume Human milk (mL/day))	Fasting (days)	Complementary feeding after six months
1	3505	3620	5	7	400	1	-
2	3575	3770	2	9	400	1	-
3	3600	8260	-	28	-	-	Yes
4	3790	3900	19	8	500	4	Yes
5	2445	2900	20	9	140	15	-
6	3145	6475	4	8	560	1	Yes
7	3225	3185	26	4	250	6	-
8	3035	3575	32	14	560	4	-
9	3030	5550	24	12	770	1	Yes
10	1570	1930	20	7	240	2	-
11	2880	8850	3	4	356	1	Yes
12	3020	5500	9	8	400	-	Yes
13	3070	5355	3	5	110	1	Yes
14	3040	2930	2	3	30	1	-
15	3018	3164	11	1	490	1	-
16	2265	2520	2	6	385	-	-
17	2595	2585	4	4	90	-	-
18	2865	5585	9	10	109	4	Yes

19	3960	3500	13	4	380	1	-
20	3360	6500	20	8	235	2	Yes
21	2865	4500	7	7	280	1	-
22	3480	3550	14	7	470	3	-
23	2850	9060	5	6	292	1	Yes
24	3260	7500	4	5	180	1	Yes
25	3655	7801	4	6	800	2	Yes
26	3440	5450	6	6	540	1	Yes
27	2810	2700	3	7	56	1	-
28	3725	3430	11	8	260	2	-
29	2400	6970	6	6	180	1	Yes
30	3030	6540	8	7	148	1	Yes
31	2640	6300	5	4	213	1	Yes
32	3370	3005	2	2	50	1	-

It is recorded that 22 (68.8%) of the human milk was offered through the mother's breast and bottle; four (12.5%) through the mother's breast and bottle; four (12.5%) through the mother's breast and bottle; one (3.1%) directly from the mother's breast and one (3.1%) associated with the mother's breast and bottle.

Acyanogenic congenital heart defects were found in 19 (59.4%) of the individuals, with Aortic Coarctation being the most prevalent five (15.7%), while cyanogenic heart defects were identified in 13 (40.6%) individuals, with Tetralogy of Fallot responsible for five (15.7%) of the cases (Table 2).

Table 2. Distribution of the CHD* identified in the medical records of the children attended at Hospital do Coração, from January 2017 to January 2019. São Paulo (SP), Brazil, 2019.

Variables	n	%
Aortic Coarctation	5	15.7
Tetralogia of Fallot	5	15.7
Transposition of great arteries	4	12.5
Interatrial Communication	3	9.4
Interventricular Communication	3	9.4
Atrioventricular Septum Defect	3	9.4
Hypoplastic left heart syndrome	2	6.2

Pulmonary Atresia	2	6.2
Pulmonary stenosis	2	6.2
Atrial Isomerism	1	3.1
Coronary Fistula	1	3.1
Double Outlet Right Ventricle	1	3.1
Total	32	100

DISCUSSION

This study aimed to identify and compare the profile of newborns and infants with congenital heart defects who are fed with human milk by different forms of supply. It is revealed that there was no considerable predominance regarding sex in this study and it was identified in a study that aimed to describe the clinical and epidemiological profile of children with CHD, analyzing 300 children, being 148 (49.3%) male and 147 (49.0%) female, stating that, in general, there is no predominance regarding sex in this profile of children.¹⁰

Among the types of CHD of children fed with human milk, Tetralogy of Fallot and Coarctation of Aorta were highlighted, however, other studies reported a higher prevalence of Tetralogy of Fallot and Transposition of Large Vessels^{1,10}, which, in this study, contemplated 9.0% of the sample.

It was verified, in order to preserve the clinic of patients with CHD and the symptoms of dyspnea, that the offer of human milk by enteral tube is one of the most indicated therapies. In a study carried out in 2016, it was noted that this technique preserves the hemodynamic energy of newborns and infants, but, on the other hand, it can bring losses in coordination, making it difficult to make the transition to the oral offer, emphasizing the importance of multiprofessional monitoring to ensure the safety of this practice.¹¹

The main result of a study that aimed to describe the impact of feeding on neurological development in children with congenital heart defects at a children's hospital in Texas (Texas Children's Hospital, Houston, USA) was that the use of a nasoenteric tube for enteral feeding after corrective congenital heart surgery presented increased risks of neurological development delays at 12 and 24 months,¹⁶ and only nine (28%) of the sample in this study used this form of combined feeding or not.

It was found in a literature review study, published in 2019, on the role of human milk in the prevention of enterocolitis and synthesis of the best methods to support breastfeeding in children with congenital heart defects, that babies who receive an exclusive diet of human milk have a lower risk of enterocolitis and obtained greater weight gain, and that the incentive through

educational practices to breastfeed is correlated with better outcomes in this practice and that this practice should be encouraged throughout the period of hospitalization of mother and baby. ¹⁷

It was demonstrated in an implementation study of better evidence carried out at Benioff Children's Hospital, linked to the University of San Francisco, California, that after pre- and post-implementation clinical audits of health education practices related to the encouragement of breastfeeding of children hospitalized with CHD, educating health professionals and parents, mothers with greater stimulus to breastfeed (78%), a significant increase in breastfeeding of children with CHD, greater confidence of mothers in breastfeeding their children with heart disease, positively impacting the breastfeeding culture at the project unit. The study also highlighted the importance of educating health professionals about breastfeeding as a support in the results of this implementation. ¹⁸

A British study also described the importance of Health Education related to the encouragement of breastfeeding, the development of an educational material related to feeding infants with CHD, being the material developed considered useful and including information on the feeding journey, other stories on infant feeding and advice on how to make the most of the moment of breastfeeding. ¹⁹

Successful results regarding breastfeeding of congenital heart disease patients by Boston Children's Hospital group are worth mentioning. They showed that children with CHD, after correction of the heart disease and maintaining breastfeeding, showed significant weight gain. The study also considered the importance of the family support network and the collaboration between the mother, family and health professionals. ²⁰

It is noted that, despite the benefits found in the use of human breast milk, this form is not always the most indicated to nourish newborns and infants, since in certain clinical situations, such as malnourished heart patients, there is a need to follow the weight gain thoroughly, in addition to complementing and fractionating the milk supply. It is observed that, in this way, there is difficulty in calculating the volume of milk received, which often leads to the indication of the use of human milk that is milked administered by an enteral tube or bottle. ¹² It is important to note that monitoring the evolution of weight is essential in these cases, since in addition to the malnutrition and low weight found in this population, there is still greater susceptibility to infections during treatment. ^{1,12}

Care is required by CHD patients admitted to the ICU, which may lead to early weaning, especially in prolonged intubation, which may bring sequelae in the coordination of breathing, swallowing and suction, as well as in airway aspiration, use of probes and mechanical ventilation. ^{2,4}

Among the complications presented after nutritional therapy, it was found that most presented abdominal distension, which is considered common among neonates admitted to the neonatal ICU using oxygen therapy¹³, although the use of the device was not evaluated in the population of this study. Complications such as diarrhea and vomiting presented lower incidences in neonates receiving human milk, which also have the advantage of reducing the severity of hospital infections and the risk of sepsis, being the food of first choice among them.¹⁴

It was observed that half of the families received more than seven minimum wages, this characteristic being important and favorable, since the lower the family income, the more affected will be the development of the bearer of CHD and vice versa.¹⁵

Among the limitations of the study are: the reduced number of the sample compromised by the inclusion criterion; the difficulty of obtaining information in the chart regarding weight, justified by the minimal manipulation that is necessary in the cardiac patient during the first postoperative days and by the routine of many ICUs, where weight measurement is standardized only once a week, and the deficit in the control of the volume of milk received by newborns and infants that presented considerable variations, including prolonged fasting time during the period of hospitalization, bringing gaps in the analysis of data.

This study contributes to the national literature since the topic of nutritional therapy and congenital heart disease in newborns and infants is still limited, highlighting the importance of knowledge about pre-existing nutritional practices, the importance of choosing and encouraging the most appropriate form for each child, with emphasis on the priority use of human milk, as well as improving the performance of the Nursing professional, who has a direct and continuous relationship in the units of admission to work in search of quality in the assistance of the mother-baby binomial and the individual needs of each child.

CONCLUSION

It is concluded that there was a predominance of infants, with a mean age of 96 days, mean birth weight of 3,080g and period of hospitalization that varied from four to 47 days; Aortic coarctation and Tetralogy of Fallot were the most prevalent heart defects; breastfeeding was the most prominent form among the milk supply routes, being offered simultaneously with the bottle; the most predominant complication was abdominal distension and dietary pause or fractionation of the diet frequently occurred in hospitalized children.

By identifying the profile of newborns and infants with congenital heart defects fed with human milk, it was possible to identify the main needs of this population and thus create strategies to fill the gaps and difficulties faced by heart patients in relation to breastfeeding.

CONTRIBUTIONS

It is informed that all the authors contributed in the conception of the article, collection, analysis and discussion of the data, as well as in the writing and critical review of the content with intellectual contribution and in the approval of the final version of the study.

CONFLICT OF INTERESTS

Nothing to declare.

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