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Pediatrics & Neonatal Biology Open Access
ISSN: 2640-2726

Becoming a Premature Birth Weight of Less than 1500g under Breastfeeding

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Review Article
Volume 6 Issue 2
Received Date: July 09, 2021
Published Date: August 02, 2021
DOI: 10.23880/pnboa-16000159

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Abstract

Objective: Study the impact of breast feeding on the fate of preterm infants with a birth weight of less than 1500g.

Patients and Methods: This was a retrospective, analytical descriptive study carried out over a period of one year (2019) at the neonatal unit of the pediatric department of the Sikasso Hospital. All premature newborns weighing less than 1500g were included. Premature infants over 1500g and term infants were excluded from the study. Chi2 test and odds ratios were used to highlight risk factors for death. The significance threshold adopted was $p < 0.05$.

Results: A total of 50 premature newborns out of 130 admitted. 53.4% female and 45.6% male. 13% of mothers were between 17 and 20 years old with a poor pregnancy in 25.1%; 56.5% were housewives; 11.8% lived in urban areas; 53.4% of premature infants had an entry weight of less than 1200g. The majority of premature babies were fed breast milk through an orogastric tube and / or a teaspoon. Fifty-four (54%) of premature infants acquired food independence between 36 and 38 weeks corrected age. At discharge, 78.8% of premature babies are kept eutrophic; 21.2% acquired ectopic growth retardation. 70% benefited from catching up the weight.

Keywords: Prematurity; Breastfeeding; Sikasso Hospital; DHA; Immunology

Introduction

Breast milk is important for the optimal growth and development of term infants and even more so for premature babies [1]. Important factors, such as DHA (a fatty acid vital for the proper development of the brain and eyes) and G immunology (an antibody), are transported from the mother to the fetus via the placenta throughout pregnancy [2]. Due to their early birth, premature babies did not fully receive these important factors in the womb, but the milk of mothers of preterm infants contains more fat and secretory immunoglobulin than the milk of mothers of term babies [1,2]. The quality of nutritional care conditions the fate of the premature infant by modulating not only its growth

but also its quality and quantity adapted to all aspects of its development, in the short or long term In order to provide optimal nutrition, two main principles must be respected: optimize parenteral nutrition early and introduce adequate enteral nutrition as soon as possible, preferably with breast milk [3]. Breastfeeding is one of the primary factors for the sustainable protection of a child's health. Several studies have objectified a positive impact of breastfeeding on the neurodevelopmental and sensory prognosis of the preterm infant in the long term [3,4]. The prevalence of breastfeeding among preterm infants is poorly known and poorly documented, but its determination is essential to increase this rate. It is with this in mind that our study proposed to study the impact of breastfeeding on the fate of premature babies who have a birth weight of less than 1500g in the neonatology unit of the pediatric department of the Sikasso hospital.

Patients and Methods

This was a retrospective, descriptive analytical study carried out over a period of one year from January 1, 2019 to December 31, 2019 at the neonatology unit of the pediatric department of the Sikasso Hospital. Included were all preterm infants under 1500g and ≥800 grams. All term infants with intrauterine growth retardation (RGIU) of less than 1500g, all preterm infants with a birth weight greater than or equal to 1500g, as well as those whose gestational age was not specified in the file and incomplete records were excluded from our study. The collection of information was carried out in two stages.

A first database collected through the hospitalization registers of newborns of the year 2019; extracted information on the number of preterm infants, sex, gestational age and some evolutionary data, namely the survival or death of preterm infants.

A second collection form was completed for each newborn containing sociodemographic, obstetrical, maternal, pregnancy follow-up and monitoring data, clinical data at admission to the ward.

The variables studied in premature infants were: gender, gestational age, anthropometric data, temperature at admission, the different evolutions during hospitalization, particularly at the respiratory, hemodynamic, metabolic, infectious, neurodeveloppemental level, the duration of hospitalization. The variables studied in the mother were: maternal age, occupation, marital status, inbreeding and place of residence, mode and place of delivery, pregnancy monitoring (number of prenatal consultations) and drug intake during pregnancy, gyneco-obstetrical and medico-surgical history. The Chi2 test and odds-ratios were used to highlight risk factors for death. The significance threshold was $p<0.05$.

Results

A total of 130 preterm infants were identified during the period of our study among them 50 met our inclusion criteria. Analysis of Table 1 revealed that almost half of the mothers were between the ages of 18 and 34 with a low socio-economic level in 60% of cases and a rural origin in 20% of cases. 42% were primiparous and 58% were multiparous. Compared to the preterm population, the gender distribution was statistically similar, the sex ratio was 0.92. The gestational age of preterm infants ranged from 28 to 36 SA. 12% had a birth weight of less than 1200g and 40% a weight between 1400 and 1499g. The majority (75%) was born in the maternity ward of the hospital and pregnancy was not followed in 56% of cases. In addition, 44% of newborns were born by caesarean section. The analysis of Table 2 representing the distribution of premature babies according to the state of trophicity reported that almost two thirds of newborns were eutrophic or 60% of cases while 40% had intrauterine growth retardation. The median size was 33.5 cm with extremes ranging from 30 to 37 cm. This size was greater than the 10th percent centile in 53%, less than the 10th percentile in 27%. The head circumference ranged from 21 cm to 25 cm with a median of 23 cm. It was above the 10th percentile in 56%, below the 10th percentile in 22%. The milks used were preterm milk (17 cases), mother's milk (33 cases). The mean corrected age of food autonomy was 36 SA (extreme 32 SA + 4 day and 54 SA + 4 day). The pathologies encountered during hospitalization were respiratory and metabolic in (27.1%), infectious in (8.2%) and hemodynamics (1.8%). The length of hospital stay varied from 05 to 90 day with an average of 24.7 day. The corrected term ranged from 34 SA + 6 d to 44 SA + 1 day with a median of 37 SA + 2 day. The weight ranged from 1500 g to 2250 g with a median of 1732 g at the outlet. The average weight gain was 19.9 g/day. Of the total of 30 children admitted eutrophic to the ward, 83.3% remained eutrophic at discharge and 16.7% acquired during the stay, post-natal growth retardation which was associated with respiratory pathologies in 53% of cases and metabolic pathologies in 25%, a prolonged duration of hospitalization 22% ($P<0.001$). As for the admitted premature infants and stunted intrauterine growth, 65% benefited from a weight catch-up and came out with a weight greater than the 10th percentile. The size ranged from 32cm to 37cm with a median of 33.75cm. The average absolute gain in size was 0.21 cm/day. Of the 30 patients with a height greater than the 10th percentile at admission, 83.9% kept at the exit a size greater than the 10thpercentile; As for the 20 patients who had a height below the 10th percentile at the entrance, 15% benefited from a statural catch-up and left with a size greater than the 10th percentile. The head

circumference ranged from 27.5 cm to 36.5 cm with a median of 32.1 cm. The mean absolute gain in head circumference was 0.1 cm/week. Of the 30 patients with a PC greater than the 10thpercentile at the entry into the service, 93.3% kept at the exit a PC greater than the 10th percentile; while 2 have fallen behind. As for the 13 patients who had at admission a PC below the 10th percentile, 92.3% benefited from a catch-up and had at the exit a PC greater than the 10th percentile. Extra uterine growth retardation (RCUE) was acquired in the ward in 6 cases, notably during the initial stay in intensive care in 4 cases. The RCEU involved a premature infant of less than 32 SA in 6 cases with an average weight of 1287 g. Early breastfeeding was observed in 78.3% of cases with an onset of enteral feeding at Day 1 of hospitalization. The majority of preterm infants were fed breast or pre-milk milk with vitamin A.D.E.C and iron. 54% of premature infants acquired food autonomy between 36 and 38 weeks of corrected age. The multivariate Table 3 analysis showed a statistically significant positive correlation (p=0.03) between breast milk and length of stay (OR=1.02; CI=0.8-1.4).

Variable (newborn)	Premature N=50
Characteristics Neonatal	
Newborn Age (day) £	0 [0-1]
Birth weight ¥	
< 1200	6(12)
1201-1399	24(48)
1490-1400	20(40)
Average length of hospital stay (day) ¶	24,7±2
Sex ¥	
Male	24(48)
Female	26(52)
Characteristics Maternal	
Maternel Age	
<18ans	16(32)
18-34ans	23(46)
>35ans	11(32)
Parity	
Primiparous	21(42)
Multiparous	29(58)
Mode delivery	
Low way	28(56)
High way	22(44)
Security Social	
Yes	15(30)
No	35(70)
Monitoring Pregnancy	
Yes	28(56)
No	22(44)
Educational Level	
Illiterate	24(48)
Primary	18(36)
Secondary	5(10)
Superior	3(6)

Values are expressed as an average ± standard deviation (¶), median (£), or number and percentage (¥).

Table 1: Characteristics Maternal and Neonatal.

Trophicity state type	Number	Total	Percentage %
On admission			
Normal weight for age	30	30	60
Intra-uterine growth retardation			
Harmonious	13		
Disharmonious	7	20	40
Total	**100**		
At the end of the service	39	39	79
Normal weight for age			
Extra-uterine growth retardation			
Harmonious	3		
Disharmonious	8	11	22
Total	**100**		

Table 2: Distribution of newborns by Trophicity State at entry and exit from the service.

Variable OR	IC à 95%	P
Breast milk 0,03	1,02	0,8-1,4
Artificial milk 0,9	1,3	12-2

OR (odds ratio): Adjusted by Logistic Regression; CI: Confidence Interval

Table 3: Correlation between feeding type and length of stay in multivariate analysis.

Discussion

This prospective study is the first study carried out in our center on the impact of breastfeeding on the fate of premature babies who have a birth weight of less than 1500g. She knows certain limits including the number of mother-newborn couples included which could be insufficient to give power to certain statistical tests. Nevertheless, it has the advantage of evaluating the impact of breastfeeding in a sample of preterm infants cared for in a neonatology reference center and of identifying the priority areas on which work must be carried out to improve this practice. The majority of our premature babies were fed mainly by breast milk combined with premature milk. This diet was administered enterally and most often through a nasogastric depending on the clinical context In front of any contraindication it was started at D1 of life in the majority of our premature babies with breast milk. This introduction was accompanied by regular monitoring of the abdominal perimeter associated with stimulation of transit if necessary given the immaturity of the digestive tract in this category [5], the latter tolerated well compared to those, in whom the diet was started with artificial milk. The start-up of artificial milk instead of breast milk was linked to the non-availability of breast milk due to the absence of mothers who had given birth in another structure (outborn), or due to a maternal pathology against indicating breastfeeding for the inborns. The main challenge is to obtain breast milk quickly and in sufficient quantities, the delay in the onset of breastfeeding was related to medical cause's in this case hospitalized mothers, accessibility problems, and phobia in adolescent primiparous. Indeed, studies have clearly shown that late breastfeeding triples the risk of death from neonatal infection (OR: 2.61; 95%, CI: [1.68, 4.04]) [6]. Parenteral feeding was based on the infusion of glucosated serum associated with ions. The relay by an enteral and/ or oral feeding was recommended later according to the state of evolution of the patient. In our series food autonomy was acquired on average at 36 SA, those who received more breast milk acquired autonomy very quickly compared to those who took more milk for preterm infants. Nutritionally 88 (73%), had a very good digestive evolution while 21% of premature infants had ulcerative-necrotizing enterocolitis (ECUN). The absence of lactarium in our environment forces us to do so. Unlike in developed countries where breast milk is induced as soon as possible thanks to the presence of this milk bank [7]. Breast milk is the ideal food for this category, starting breastfeeding as soon as possible because it has positive effects on the digestive system leading to an increase in intestinal growth, a decrease in intestinal mucosal atrophy, an increase in enzyme activity, a decrease in abnormal bacterial colonization, a decrease in the duration of parenteral feeding and its complications (sepsis, cholestasis)

[8]. A correlation has been observed between the decrease in the length of stay and the practice of feeding with breast milk in our context. This reinforces the so-called literature [9]. 78% of premature babies came out eutrophic; these data are comparable to those of K.V. Assea and al in Côte d'Ivoire who observed a rate of 74% [10]. Enteral nutrition is the most physiological modality to provide an adapted diet [11]. The maintenance of optimal brain growth in eutrophic premature or catch-up in 43% of hypotrophic is an encouraging result for the neurological fate of these children. In our study the factors related to ectopic growth retardation found in 16.7% of premature babies were among others related to a very low birth weight<1200 in 26.7% with an RR=1.1; an ECUN 19.2% of cases (P<0.012), an extended duration of hospitalization. Reasons, often entangled, can explain the occurrence of ectopic growth retardation such as high prematurity with hypotrophy and the existence of associated pathologies [12]. Hypotrophic preterm infants are much more exposed to ECUN due to greater weight loss during the first few days of life [13,14]. Preterm children of low birth weight frequently exhibit postnatal growth retardation, at the end of their hospitalization, most have a weight below the 10th percentile of the fetal reference weight this was not the case in our context [15].

Nutritional recommendations, which until now have been aimed at enabling a premature infant to have a growth rate equivalent to that of the foetus in utero and preventing deficiencies, are currently the subject of debate [1]. A large number of premature babies have uncompensated growth retardation during the first weeks of life [1]. Current recommendations take into account the quality of weight gain (lean mass) and the need to obtain catch-up growth as early as possible [15]. This study will help to increase mother's awareness of breastfeeding in preterm infants and to improve the literature's deficit in relation to this subject.

Conclusion

Breastfeeding rates remain well below the recommended targets. Special attention should be paid to mothers of weak children.

Contributions by Authors

All authors have contributed to the conduct of this work. All authors also state that they have read and approved the final version of the manuscript and have no conflict of interest.

Thanks

Our thanks to the entire team of the pediatric department; Department of Obstetric Gynecology and administration of Sikasso hospital.

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