

Current Situation and Influencing Factors of Preterm Infants Breastfeeding in Jingzhou 3A Hospital

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Abstract

Background: Breast milk is the best source of nutrition for premature infants and a "good medicine" for disease treatment. However, the rate of exclusive breastfeeding of premature infants in China still needs to be improved at present, and the factors affecting breastfeeding are different in different places. Objective: To investigate the current status and influencing factors of preterm infants breastfeeding in Jingzhou 3A hospitals. Methods: A cross-sectional study was conducted to collect breastfeeding information of premature infants in neonatal intensive care unit (NICU) from May to August in 2019 in Jingzhou 3A Hospital, and 152 premature infants' related information were collected. A questionnaire survey was conducted among the mothers who failed to breastfeed. Results: The rate of exclusive breastfeeding among premature infants in NICU was 9.87%. The rates of first breastfeeding and exclusive breastfeeding at discharge were 13.16% and 32.89% respectively. Not producing enough milk and knowing the right way to pump breast milk contributed a lot to the failure of exclusive breastfeeding. Conclusion: More attention should be paid to the health education and management to improve the rate of breastfeeding in NICU.

Keywords

Breastfeeding, Premature Infant, Neonatal Intensive Care Unit

1. Introduction

As the most suitable food for neonates, especially premature infants, breast milk not only provides important nutrients such as amino acids for the rapid growth of neonates and premature infants, but also enhances their resistance to pathogenic microorganisms, playing an important role in the treatment of premature infants [1]. In the "Global Strategy on Infant and Young Child Feeding" initiated by the World Health Organization and the United Nations Children's Fund, it is clearly proposed that infants should be exclusively breastfed for six months [2]. WHO and international agencies are actively promoting neonatal intensive Care Unit (NICU) breastfeeding and have developed safer methods for premature infants. However, the latest research report [3] shows that the rate of breastfeeding in 42.5% hospitals in China is still below 50%, and the situation of breastfeeding varies from region to region, which is far from the WHO standard. The breastfeeding rate of NICU in China is low, and the relevant influencing factors are also different in different regions. The study is to know the breastfeeding situation and the main influencing factors of premature infants in Jingzhou Grade A hospital.

2. Materials and Methods

2.1. Participants

Participants were selected by convenience sampling approach and recruited from May to August in 2019 in Jingzhou 3A hospitals. According to the formula, $n = u_{\alpha/2}^2 \pi (1-\pi)/\sigma^2$, $\alpha = 0.05$, $u_{\alpha/2}^2 = 1.96$, $\pi = 0.1$, $\sigma = 0.05$, the sample size is 138. In addition, given that the estimated attrition rate is 10%, a sample size of 152 was used. The inclusion criteria were as follows: 1) premature infants in the NICU whose mothers had no contraindications to breast milk and are eligible for breastfeeding; 2) premature infants whose families were willing to participate in the interview. The exclusion criteria were as follows: 1) premature infants having digestive tract malformations, 2) the mothers having communication disorder.

2.2. Methods

2.2.1. Cross-Sectional Study

From May to August in 2019, the feeding conditions of preterm infants meeting the inclusion criteria were observed, such as the bed number, name, gender, hospital number, gestational age, weight when entering the NICU, clinical diagnosis, feeding method, breastfeeding rate (including the first breastfeeding rate, the rate of exclusive breastfeeding during hospitalization, the rate of breastfeeding at discharge), and the route of breastfeeding.

2.2.2. Questionnaire on Reasons for Non-Breastfeeding

Questionnaire Self-designed according to literature review and survey purpose. The questionnaire consists of two parts: the first part is the basic information of premature mothers, including age, occupation, monthly income, parity, birth weight, gestational age, delivery mode. The second part is the possible reasons of non-breast-feeding. The details can be seen in the appendix. The internal volume validity index of the questionnaire was 0.92, Cronbach's a coefficient was

0.846.

2.2.3. Data Collection

Conduct unified training for investigators. Mothers who breastfed within three days of the NICU hospital stay were assigned to the breastfeeding group, and mothers who did not breastfeed were assigned to the non-breastfeeding group. After the children had been hospitalized for 3 days in the NICU, a questionnaire was distributed to the mothers of the children based on informed consent, and the method of filling in the questionnaire was explained. The non-breast-feeding group filled in the questionnaire on reasons for non-breastfeeding. The questionnaire was filled out by the mother herself and returned to the investigator after completion. The collected data were checked and input by two researchers.

2.2.4. Statistical Analysis

Frequency, percentage, mean, and standard deviation were used to describe the results of general demographic and the reasons of not breastfeeding. SPSS17.0 software was used for data entry and statistical analysis.

3. Results

3.1. Demographic Characteristics and Feeding Methods of Premature Infants in NICU

Demographic data of premature babies and their mothers are shown in **Table 1**. Among 152 premature infants, the rates of exclusive breastfeeding, mixed feeding and artificial feeding were 9.87%, 44.08% and 46.05% respectively. The rate of breastfeeding was significantly lower than that of mixed feeding and artificial feeding.

3.2. Rate of First Breastfeeding and Rate of Breastfeeding at Discharge

Most premature infants didn't receive breast milk for the first time, and rate of exclusive breastfeeding at the time of discharge remained low. Only 13.16% of the premature infants received breast milk as their first bite, and the rate of exclusive breastfeeding at discharge was only 32.89% (Table 2).

Demographic characteristics	Exclusive breastfeeding group (n = 15)	Mixed feeding Group (n = 67)	Artificial feeding group (n = 70)
gestational age (week)	34.42 ± 1.68	33.37 ± 0.51	32.45 ± 0.53
gender			
male	7	31	32
female	8	36	38
weight at admission(kg)	2.32 ± 0.35	1.92 ± 0.54	2.17 ± 0.54
mother's age (year)	27.00 ± 2.33	25.93 ± 3.43	24.95 ± 3.23

Table 1. Demographic characteristics and feeding methods of premature infants.

3.3. Feeding Routes of Premature Infants in NICU

For premature infants with weak sucking ability, nasogastric tube is used for feeding. For premature infants with intestinal intolerance, intravenous nutrition was used. The oropharyngeal administration of breast milk was rarely used (**Table 3**).

3.4. Factors Influencing Breastfeeding of Premature Infants

There were many factors that affected breastfeeding for premature infants, of which not having enough breast and knowing the right way to pump breast milk were the main reasons. In addition, mothers' not knowing the right way to store breast milk, not knowing that the NICU received breast milk and thinking that the formula was as good as breast milk were all the causes of failure to breastfeed (**Table 4**).

4. Discussion

4.1. Breastfeeding Rate in NICU Needs to be Improved

Breast milk has advantages that no other food can replace, especially for the premature infants. The WHO says breastfeeding should be the first choice for premature infants [4]. A large number of studies [5] [6] [7] [8] have shown that

Table 2. Rate of breastfeeding of first bite and at discharge.

time	n (%
breastfeeding of first b	te 20 (13.
exclusive breastfeeding at d	scharge 50 (32.
able 3. Feeding routes of premature infan	s.

Table 4. Influencing factors of not breastfeeding.

oropharyngeal administration

parenteral nutrition

influencing factors	n (%)
Not producing enough breast milk	42 (60.00)
Don't know the right way to pump breast milk	40 (57.14)
There is no milk secretion	23 (32.86)
Don't know the right way to store breast milk	20 (28.57)
Mothers think formula is as good as breast milk	15 (21.43)
The family did not know that the NICU received breast milk	10 (14.29)

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8 (5.26) 9 (5.92) breastfeeding is beneficial to reduce the mortality rate of premature infants in NICU, reduce the risk of complications such as necrotizing enterocolitis, bronchopulmonary dysplasia, retinopathy of prematurity and so on, promote the development of the nervous system of premature infants, and shorten the hospital stay and medical expenses of premature infants.

According to the Program for the Development of Chinese Children (2021-2030), exclusive breastfeeding rate for infants aged 0 - 6 months will reach more than 50% by 2030. However, several studies have shown that breastfeeding rates in NICU need to be improved. In this study, the exclusive breastfeeding rate in NICU was only 9.87%. Therefore, finding out the factors affecting breastfeeding in NICU and carrying out targeted intervention are important.

4.2. Oropharyngeal Colostrum Administration Should be Promoted

In this study, bottle-feeding accounted for 51.97%, and nasogastric tube feeding was mostly used in premature infants who could not be bottle-fed, the rate of breast milk delivery through the oropharyngeal route was low.

Because of the imperfect development of organ function and gastrointestinal function, premature infants are prone to feeding intolerance. In recent years, more and more studies have proved that breast milk can play an immune role through the absorption of oropharyngeal mucosa, and oropharyngeal delivery of breast milk to premature infants has been shown to be a safe and reliable method [9] [10] [11] [12]. SlgA and lactoferrin were found to be the most valuable non-cytokine immune components in high levels of breast milk during oral and pharyngeal breastfeeding. These two antibacterial components can be excreted in the urine and stool of breastfed infants, suggesting that breast milk can be absorbed by mucous membranes to prevent infection. Oropharyngeal breastfeeding should be considered as an immunotherapy. In this way, premature infants can receive colostrum, transitional milk and mature breast milk without being affected by factors such as incomplete gastrointestinal function and immature swallowing function, thus maximizing the immune effect of breast milk. There are two main ways to give breast milk to premature infants through the oropharyngeal pathway-oropharyngeal drip or oral care. For children who cannot be fed orally in the early stage due to feeding intolerance, mechanical ventilation, and unstable internal environment caused by hypoperfusion, colostrum should be collected and smeared with sterile cotton swabs or injected with a 1 ml sterile syringe [13]. Oral care for premature babies using breast milk is a simple way that can be used as a nursing routine.

4.3. Health Education on Breast-Feeding of Premature Infants Should Be Strengthened

This study showed that more than 50% mothers of premature infants do not have enough milk, and do not know how to pump milk properly. Other factors that affect breastfeeding include not knowing how to store breast milk, not having breast milk, thinking formula is as good as breast milk and so on. The nurses should inform mothers about breastfeeding through various health education methods. Research shows that prenatal breastfeeding propaganda and systematic management of propaganda and cluster management contribute to improving breastfeeding rate. Therefore, training and assessment should be carried out to make propaganda content accurate and standardized. The education should be consistent and proactive, especially for high-risk pregnant women, the importance of maintaining lactation after preterm delivery should be informed in advance, and they should be encouraged to prepare lactating materials in advance.

5. Conclusion

Mothers of preterm infants failed to breastfeed or delayed breastfeeding because they did not produce milk, or did not produce enough milk. Therefore, more attention should be paid to the health education on how to pump and secrete breast milk as soon as possible. Health care providers and families should know the importance of breastfeeding and work together to improve breastfeeding rate for premature infants.

6. Limitation

Due to the limited resources and other reasons. In this study, convenience sampling method was adopted to investigate the breastfeeding situation of premature infants in NICU of 2 grade A hospitals in Jingzhou city only. It is necessary to carry out multi-center research in the future.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix

No Breastfeeding Related Factors Questionnaire

Part 1. General Information

1. Name:				
2. Age:				
3. Occupation:				
4. Education:				
a. primary education	b. junior high	school education	c. high school education	
d. college degree	e. bachelor degree or above		f. no formal education	
5. Monthly income:				
a. <2000	b. 2000 - 4000	c. 4000 - 6000	d. >6000	
6. Gestational weeks:				
7. Parity:				
8. Delivery mode:				
a. natural birth	b. caesarean sectio	n		
9. The baby was born in this hospital				
a. yes	b. no			
10. Home address:				
a. local	b. non-local			

Part 2. Influencing Factors of not Breastfeeding

1. Your failure to breastfeed or exclusively breastfeed is	related to the failure to be	reastfeed as requested by the neonat-		
al intensive care Unit (NICU) staff.	a. yes	b. no		
2. Your failure to breastfeed or exclusively breastfeed is related to your not knowing that the neonatal intensive car				
Unit (NICU) receives breast milk.	a. yes	b. no		
3. Your failure to breastfeed or exclusively breastfeed is related to the fact that your obstetrician does not require you				
to breastfeed as soon as possible.	a. yes	b. no		
4. Your failure to breastfeed or exclusively breastfeed is related to the failure of the maternity nurse to ask you to				
breastfeed as soon as possible.	a. yes	b. no		
5. Your failure to breastfeed or exclusively breastfeed is related to the fact that you don't know the proper method of				
pumping breast milk.	a. yes	b. no		
6. Your failure to breastfeed or exclusively breastfeed is related to the fact that you don't know the proper method to				
store breast milk.	a. yes	b. no		
7. Do you think that taking formula is the same as taking breast milk, or better than taking breast milk?				
	a. yes	b. no		
8. Your failure to breastfeed or exclusively breastfeed is related to the fact that living too far away from the ward to				
deliver breast milk.	a. yes	b. no		
9. Do you have no lactation?	a. yes	b. no		
10. Don't you have enough breast milk for your baby?	a. yes	b. no		