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Early conditions in the breastfeeding of premature newborn infants

Condições iniciais no aleitamento materno de recém-nascidos prematuros

ABSTRACT

Purpose: To describe the breastfeeding initial conditions for premature infants. **Methods:** The sample consisted on 26 mother/baby dyads. The babies had an average of 36.1 weeks corrected gestational age and were hospitalized in a Neonatal Intensive Care Unit in Southern Brazil. Data was collected from medical records, and the observation of the dyads was conducted during feeding, using the Observation and Evaluation of the Breastfeeding Protocol. Favorable and unfavorable behaviors were registered regarding position, responses, suction, affection and anatomy of the breast. After the observation, a questionnaire was applied to the mothers. **Results:** The best results refer to the position of mother/child and affection and the poorer ones to the infant responses. Statistically significant correlations by the Spearman Correlations Coefficient were observed between some items of the protocol and other study variables. **Conclusion:** Most premature infants from this sample presented a satisfactory initiation on analyzed aspects referring to breastfeeding. Still, we emphasize the need of practices for breastfeeding effectiveness and its encouragement in this population.

RESUMO

Objetivo: Descrever as condições iniciais do aleitamento materno de prematuros. **Métodos:** A amostra foi constituída de 26 binômios mãe/bebê. Os bebês tinham idade gestacional corrigida média de 36,1 semanas e estavam internados numa Unidade de Tratamento Intensivo Neonatal da região sul do Brasil. Foi realizada coleta de dados dos prontuários e observação dos binômios durante a alimentação, por meio do Protocolo de Observação e Avaliação da Mamada. Foram registrados os comportamentos favoráveis e desfavoráveis quanto à posição, respostas, sucção, envolvimento afetivo e anatomia da mamas. Em seguida, foi aplicado um questionário às mães. **Resultados:** Os melhores resultados referem-se à posição mãe/criança e afetividade e os piores às respostas do neonato. Quanto à associação das variáveis do protocolo, tanto entre si quanto com as demais variáveis do estudo, houve diferença e correlação direta para alguns itens. **Conclusão:** A maioria dos prematuros apresenta início satisfatório nos aspectos analisados em relação ao aleitamento materno. Mesmo assim, salienta-se a necessidade de práticas para efetividade do aleitamento materno e incentivo nessa população.

Study conducted at the Maternity Mário Totta, Complexo Hospitalar Santa Casa – Porto Alegre (RS), Brasil.

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INTRODUCTION

Breastfeeding (BF) in premature newborn infants (PNI) has been the subject of many recent studies⁽¹⁻⁵⁾. Despite the importance of breastfeeding being already established in the literature, mothers, babies, and health care professionals experience peculiar difficulties during hospitalization.

For PNI, limitations are linked to the instability of their basic life functions and also to the immature sucking reflex and swallowing^(1,6,7). Neurological immaturity, abnormal muscle tone, depressed oral reflexes, general weakness and difficulties in self-regulation can diminish the quality of oral motor skills of PNI⁽⁶⁻⁹⁾. The complications that the PNI may present during the neonatal period are, in turn, responsible for prolonged periods of hospitalization and sequelae that may compromise the clinical outcome, including BF process^(6,7).

Besides BF being the most appropriate way to provide food for the growth and development of infants, including PNI, it also influences the biological and emotional health of the mother/baby dyad^(1,10). The feeding process is seen as the first moment of social interaction and the synchronicity and reciprocity between mother and baby represents the first occurrence of the dialog dyad^(5,11). However, mothers of premature babies may have emotional and psychological barriers to initiate and maintain BF^(4,5,12,13).

Thus, there is a concern in directing attention not only to the survival of the PNI, but also to a more comprehensive, humane, and preventive care from the perspective of the individual, aiming the quality of life of these babies and providing the appropriate development of their oral functions^(1,14). The BF incentive should occur as early as possible in order to meet the nutritional needs of PNI, improve mother/baby relations and also include the mother on the care process while the PNI is at the Neonatal Intensive Care Unit (NICU).

The PNI is capable of nourishing through BF when provided with appropriate assistance and support. In order to enable this process of promotion, protection and support of BF in PNI, health care professionals must be prepared to integrate the clinical management of lactation to the routine operation of the high-risk nursery and/or NICU^(1,3,5,7,15). Among the recommended actions in support of BF is the observation of each mother/baby dyad during a BF process. Through the application of standardized protocols, it is possible to assess a group of mothers and babies with special support needs for a successful start of BF⁽¹⁶⁾.

Many studies address the importance of BF in PNI^(1,3-5,13,15), but only a few use standardized protocols for such assessment^(17,18). Based in these information, the purpose of this study was to describe the initial BF conditions of PNI admitted to a NICU.

METHODS

An observational, prospective and non-comparative study (cross-sectional) was conducted. The research was carried out at the NICU Mario Totta, Hospital Santa Casa, Porto Alegre. This Hospital is one of the referred institutions entitled Baby

Friendly Hospital, in the state of Rio Grande do Sul, Brazil.

The study involved 26 mother/baby dyads who were sampled by convenience. In order to evaluate the initial aspects of the BF process of the PNI, the first or second BF was evaluated – as long as the time between the two feedings did not exceed more than three hours. The following inclusion criteria were adopted: infants with gestational age between 30 and 37 weeks who were released by the NICU team to be breastfed. The exclusion criteria were: PNI who presented congenital malformations, metabolic disorders, syndromes, gastroesophageal reflux, neurological alteration, pneumonia, twins, and those whose mothers did not agree to participate in the study. Infants who received oral motor stimulation by the Speech-Language Pathology team were also excluded. This study was approved by the Research Ethics Committee of Santa Casa de Misericórdia de Porto Alegre, under protocol number 230/07.

The first phase of the study consisted on data collection of the PNI medical chart with the purpose of verifying dyads who matched the established criteria. Information such as pathologies involved as reason for admission, gestational age, and prescribed diet for the day was collected.

Before clinical observation and evaluation of mother and baby behavior during BF, all participant mothers signed a consent form. A nationally standardized protocol⁽¹⁶⁾ was selected for the assessment (Table 1). This protocol consists of several actions defined as favorable to breastfeeding or suggestive of breastfeeding difficulties (negative behaviors). These actions refer to body position of the mother and baby during BF, responses both of the mother and the baby when initiating BF, issues related to suction, emotional involvement between mother and baby and the anatomical characteristics of the breast. The number of negative behaviors is used for classification: a) mother/child position: good (zero to one behavior), regular (two to three behaviors) and bad (four to five behaviors); b) responses of the dyad: good (zero to one behavior), regular (two to three behaviors) and bad (four to six behaviors); c) suction adequacy: good (zero to one behavior), regular (two to three behaviors) and bad (four to six behaviors); d) anatomy of the breast: good (zero behavior), regular (one behavior) and bad (two to four behaviors), e) affectivity: good (zero behavior), regular (one behavior) and bad (two to three behaviors).

After the offer of the diet, a questionnaire was administered to all participant mothers. The questionnaire consisted of information such as: maternal age, marital status, education, pre-natal visits, delivery type, previous children (and previous experience with BF), and whether the mother had received information about BF during pregnancy. All mothers were admitted to the hospital by the Unified Health System (*Sistema Único de Saúde*). Mean maternal age was 27.8±8.2 years; half mothers had completed high school. Of the 11 mothers with previous children, 81% had breastfed. All mothers had pre-natal visits and the average number of visits was 6.4±2.4. Of all mothers, 96.2% had received prior information about BF. As for the current pregnancy, 24 mothers (92.3%) delivered by cesarean section and the mean gestational age at birth was 33.8 weeks. On the date of application of the Protocol, the mean corrected gestational age was 36.1 weeks.

Chart 1. Protocol of breastfeeding observation and assessment⁽¹⁶⁾

Favorable behaviors	Unfavorable behaviors
Position <input type="checkbox"/> Mother relaxed and comfortable <input type="checkbox"/> Body and head of the baby touching the breast <input type="checkbox"/> Baby's chin touching the breast <input type="checkbox"/> Baby's bum supported Score: _____	<input type="checkbox"/> Mother with tense shoulders and leaning over the baby <input type="checkbox"/> Baby's body away from the mother <input type="checkbox"/> Baby is with the neck turned <input type="checkbox"/> Baby's chin not touching breast <input type="checkbox"/> Only shoulders/head supported Score: _____
Responses <input type="checkbox"/> The baby looks for the breasts when hungry <input type="checkbox"/> Baby turns and searches for the breasts <input type="checkbox"/> Baby explores breast with his tongue <input type="checkbox"/> Baby is calm and alert at breast <input type="checkbox"/> Baby grasps the nipple <input type="checkbox"/> Signs of milk ejection Score: _____	<input type="checkbox"/> No response to breasts <input type="checkbox"/> No search observed <input type="checkbox"/> Baby is not interested in the breast <input type="checkbox"/> Baby restless or crying <input type="checkbox"/> Baby does not keep the grasping of the nipple <input type="checkbox"/> No sign of milk ejection Score: _____
Bonding/affective establishment <input type="checkbox"/> Mother securely holds the baby <input type="checkbox"/> Mother and baby keep eye contact <input type="checkbox"/> Loads of touches between mother / baby Score: _____	<input type="checkbox"/> Mother nervously holds the baby <input type="checkbox"/> No mother / baby eye contact <input type="checkbox"/> Mother and baby barely touching Score: _____
Anatomy <input type="checkbox"/> Breasts are soft and filled before breastfeeding <input type="checkbox"/> Nipples protruding out <input type="checkbox"/> Breast tissue with healthy appearance <input type="checkbox"/> Breasts with rounded appearance Score: _____	<input type="checkbox"/> Breasts are engorged and hard <input type="checkbox"/> Flat or inverted nipples <input type="checkbox"/> Breast tissue with bruises, cracks, redness <input type="checkbox"/> Breasts are stretched or dropped Score: _____
Suction <input type="checkbox"/> Mouth wide open <input type="checkbox"/> Lower lip protrudes out <input type="checkbox"/> Tongue of the baby takes the form of a cup around the nipple <input type="checkbox"/> Cheeks with rounded appearance <input type="checkbox"/> Suction is slow and deep with periods of activity and rest <input type="checkbox"/> It is possible to see and / or hear swallowing Score: _____	<input type="checkbox"/> Mouth almost closed, making a nozzle forward <input type="checkbox"/> Lower lip turned in <input type="checkbox"/> It is not possible to see the baby's tongue <input type="checkbox"/> Cheeks are tense or hollow <input type="checkbox"/> Suction is quick with clicks <input type="checkbox"/> It is possible to hear loud noises, but not swallowing Score: _____

Besides the above, mothers should also answer the following questions: How do you believe was the first breastfeeding process of your child? How do you think your baby has adapted to the breast? How do you think was the baby sucking ability? Do you intend to continue breastfeeding after your child is dismissed from the hospital?

The collected variables were: characterization of PNI data, characterization mother data, behaviors that are favorable and unfavorable to breastfeeding. Data were stored in an Excel/97 spreadsheet. For analysis, the Statistical Package for Social Science (SPSS) for Windows, version 10.0 was used. The frequency of unfavorable behaviors for each aspect of BF was investigated. The evaluation scores were calculated according to the number of observed negative behaviors. Categorical variables were analyzed through absolute frequency and

relative frequency in percentage. Quantitative variables were analyzed through mean and standard deviation values. In order to investigate the association and comparison among variables, the Fisher exact test and the Spearman correlation analysis were applied. The significance level adopted was 5% ($p \leq 0.05$).

RESULTS

Regarding the questionnaire administered to the mothers after observation: 34.6% of mothers considered the first breastfeeding as "good"; 61.5% of mothers felt strong suction; nipple grasp was identified by 50% of mothers; all mothers intended to continue breastfeeding after hospital dismiss.

The best results refer to mother/baby position and affection.

The state of consciousness predominantly observed in PNI (50%) was sleepy⁽¹⁹⁾. Breastfeeding observation results during BF are presented in Table 1.

It was verified that most dyads exhibited adequate scores, indicating satisfactory beginning of BF regarding the analyzed aspects. The occurrence of more unfavorable scores – i.e. many behaviors suggestive of difficulties that can lead to early weaning – were observed in 26.9% of the cases, they were: baby does not demand breastfeeding, baby did not search for the breast, fussy and crying baby, baby unable to adapt to the areola, and mother with no signs of milk ejection.

Correlation analyses among the variables of the protocol were calculated (Table 1). It was found that the following variables had significant results ($p < 0.05$) indicating a direct correlation (Spearman correlation coefficient = r_s): mother/child position x responses of the dyad - the better the mother/child position, the better the evaluation of the responses of the dyad; mother/child position X suction adequacy – the better the mother/child position, the better the suction adequacy; responses of the dyad X suction adequacy – the better the evaluation of the responses of the dyad, the better the suction adequacy.

When analyzing the scores of the protocol and other study variables, direct correlations ($p < 0.05$) were observed between:

- mother/child position and: corrected gestational age ($p=0.043$), maternal assessments on the first BF ($p=0.008$), suction evaluation ($p=0.002$);
- responses of the dyad and: gestational age at birth ($p=0.042$), maternal assessments on the first BF ($p=0.016$), suction evaluation ($p=0.01$);
- affection and state of consciousness of the baby: the more alert baby is, the better the evaluation ($p=0.021$);
- anatomy of the breasts: the higher the corrected gestational age of the baby, the better the evaluation ($p=0.045$), which was characterized by the following variables of favorable behaviors: soft and full breasts before breastfeeding, nipples jutting out, breast tissue with healthy appearance, and breasts with rounded appearance;
- suction adequacy and: mother assessment on the first BF ($p=0.005$) and mother assessment regarding suction ($p=0.004$).

There was no difference between protocol items and the other variables (maternal age, marital status, education, previous children, previous experience with BF and receipt of

Table 1. Percentage and correlation between scores of breastfeeding assessment

Variable	n (%)	Position mother/infant	Responses of the mother/child dyad	Affection	Breast anatomy	Suction adequacy
Position mother/infant			$r_s=0.698$ $p=0.000^*$	$r_s=0.164$ $p=0.424$	$r_s=0.048$ $p=0.818$	$r_s=0.583$ $p=0.002^*$
Good	21 (80.8)	-				
Regular	5 (19.2)					
Poor	0 (0)					
Responses of the mother/child dyad				$r_s=0.014$ $p=0.946$	$r_s=0.043$ $p=0.837$	$r_s=0.595$ $p=0.001^*$
Good	12 (46.2)					
Regular	7 (26.9)					
Poor	7 (26.9)					
Affection					$r_s=0.066$ $p=0.748$	$r_s=0.281$ $p=0.165$
Good	21 (80.8)					
Regular	4 (15.4)					
Poor	1 (3.8)					
Breast anatomy						$r_s=0.317$ $p=0.114$
Good	11 (42.3)					
Regular	11 (42.3)					
Poor	4 (15.4)					
Suction adequacy						
Good	14 (53.8)					
Regular	9 (34.6)					
Poor	3 (11.5)					

* Significant values ($p \leq 0.05$) – Spearman correlation

Note: r_s = Spearman coefficient, p = p-value

information regarding breastfeeding during pregnancy). There was also no difference when comparing data collected in the first or second feeding.

DISCUSSION

Although most mothers of PNI do not receive systematic support for BF⁽²⁰⁾, the desire to BF, even after hospital dismissal, is quoted in the literature⁽²¹⁾. In the current study, previous factors related to BF – including those mentioned above – were positive. This data, as well as others that will be discussed throughout this study, were probably influenced by the fact that the institution where the research was conducted is considered a Baby Friendly Hospital.

The mean maternal age of the sample was similar to that observed in other studies^(20,22). The fact that the mothers are older is referred to as a protective factor for BF in premature infants⁽²³⁾. Another item that relates positively with favorable BF factors found in this study is education. Other studies have also described a direct relationship between low education levels and negative interference in BF⁽¹⁴⁾. However, it should be noted that in other studies the educational level was lower^(24,25) than the one observed in the current study.

The number of prenatal visits observed followed the recommendations by the World Health Organization, also in agreement with other regional studies^(20,25,26). This data is important because during prenatal visits mothers are initially encouraged to BF, and this must propagate in the peri- and postnatal periods.

BF counseling is essential for mothers to feel encouraged to breastfeed their infants. The lack of maternal experience and information can often lead to early weaning as they are not prepared to face the possible difficulties that may arise during the process. The need for a professional Speech-Language Pathologist emphasizing the benefits of BF in the development of orofacial structures, speech and language is reinforced⁽²⁷⁾.

Specifically regarding the evaluation protocol, the present study demonstrated that the mother/baby dyads exhibited some difficulties with the initiation of BF in at least one aspect of the feeding process. In the literature two studies that used the same protocol were found, but those studies focus on term newborns who had not received intensive care. These authors reported that about 20% to 60% of mother/baby dyads have some difficulty in BF initiation^(16,24).

Mother and PNI position during BF was classified as good. This result differs from a study that found that the early problems among the mother/baby dyads mainly refer to position during BF, making the proper grasp for suction very difficult⁽¹⁶⁾. A study conducted at the beginning of BF found that two-thirds of mothers/babies had problems regarding positioning and grasping⁽¹⁴⁾. These results justify the relationship observed in the current study that the better positioned the baby is, the better the suction behaviors and responses will be.

It is important to verify if the mother is well positioned, relaxed, able to keep the body of her infant close to hers and the head and body of the baby aligned⁽²⁸⁾. It is noteworthy that the position of the dyad during BF is much more than a functional control of the body – it is related to the interactive

processes of the mother with her infant and the performance of oral motor function.

The results considered poor (poor score) were compared to responses of the newborn (baby's interest for breastfeeding, fussy or crying baby and baby that keep the grasp to the areola). This result may be related to the conditions of PNI. Long periods of hospitalization, lack of proper oral stimulation and necessary medical procedures contribute to feeding difficulties in preterm infants^(6,7). Furthermore, the side effects of non-oral feeding methods include reduction of sensory input in the mouth, disorganization of oral function, and reduced suction ability⁽²⁰⁾. Through BF assessment or previous assessment of PNI, there is a high probability of early detection of oral disorders in the infant⁽²⁹⁾.

The interest in BF and maintenance of the areola attachment included in the unfavorable behaviors of the current study may be related to the inadequate search reflexes of PNI, corroborating to other study that has also found alteration in such reflex on this population⁽²⁰⁾. The importance of searching reflex is highlighted – it is the precursor to a correct nipple grasp, directing the lips and tongue to attach to the areola and nipple⁽²⁹⁾.

Another item to consider is that half the number of PNI was on a drowsy state of consciousness. The ideal state to successfully start feeding is called the quiet alert, in which the child stays awake, with attentive look, responsive to the stimulation received, and normal heart and respiratory rates⁽¹⁹⁾. One study⁽⁹⁾ with PNI demonstrated a higher probability of suction (with appropriate characteristics) with increasing corrected gestational age, which probably is also related to the state of consciousness.

The affection between mother and child was one of the items with highest favorable behavior, unlike data reported in the literature^(4,5,12,13,20). It was found that the more alert baby was the better was the evaluation of affection. These results may be related to the feeling of satisfaction and pleasure of the mother in being able to breastfeed and offer comfort and safety to the child. Some studies cite that the feelings of mothers change along with the possibility of BF establishment and the evolution of PNI^(2,13).

Given the results presented and the above discussed points, it is important to emphasize that in addition to strategies for the initiation and maintenance of lactation in the NICU, one should also focus at the periods prior to BF, enabling early contact between mother and baby and oral stimulation of PNI. It is observed that the poorer results were related to the limitations presented by the PNI. This highlights the importance of Speech Therapy at NICU and enables, through observation and assessment of BF, early detection of difficulties that endanger the process of BF.

Providing the PNI a safe, pleasant, and functional feeding is of responsibility of health care professionals, including Speech-Language Pathologists who work at NICU. Through observation it is possible to detect oral disorders that may interfere with BF. The bond between mother and baby should also be noted: how the mother holds the baby, the physical touch and eye contact during breastfeeding⁽²⁹⁾. A discussion

of these practices is needed as well as the implementation of care protocols aimed at encouraging and promoting BF in PNI.

CONCLUSION

Most mother/PNI dyads present overall satisfactory breastfeeding initiation, and the affectivity and position of mother/infant are among variables with the most favorable behaviors. The highest index of unfavorable behaviors observed in early BF is related to PNI responses, which probably results from the immaturity of oral reflexes of this population. The implementation of new practices of BF effectiveness and encouragement is necessary. Full support to health care professionals is essential with the aim of helping, clarifying and resolving the difficulties presented both by mother and PNI.

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