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Prague Newborn Behaviour Description Technique: Experimental Version

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Abstract

The Prague Neonatal Behavior Description Technique (PNBDT) in its experimental version is a schema for evaluation of the behavior of the dyad newborn-mother before, during and after breastfeeding.

As the breastfeeding itself is taken as a central situational background, especially important for a newborn, because it influences his early interaction, experience and behavior, the mother's breastfeeding technique is also evaluated. To avoid stressing a newborn, the strategy of examination is predominantly based on observation. The observer enters the situation through structured social interaction, provided that the newborn is in the state of spontaneous tranquil alertness. The PNBDT is a psychological behavioral method that allows for the estimation of individual differences in the newborn's behavior and his level of well-being. This method is free from neurological items. Clinical experiences with the PNBDT are positive and the method will be further refined and standardized for clinical use.

A separate part of the method is a mother report assessing a newborn's modal behavior based on the Newborn Temperament Questionnaire (NTQ). Using the PNBDT with the NTQ enables a newborn's actual and modal behaviors to be compared.

Zusammenfassung

Die Prager Neugeborenen-Verhaltens-Beschreibungs-Technik (PNBDT) ist in ihrer vorläufigen Version ein Schema zur Bewertung

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des Verhaltens der Mutter-Kind-Beziehung vor, während und nach dem Stillen.

Die Stillsituation ist für das Neugeborene besonders wichtig, weil sie seine Beziehungnahme, sein Erleben und Verhalten beeinflußt. Deshalb wird auch die Stilltechnik der Mutter eingeschätzt. Um eine Beunruhigung des Neugeborenen zu vermeiden, verläuft die Einschätzung vor allem auf der Basis von Beobachtung. Der Beobachter verhält sich so, daß das Neugeborene sich im Zustand ruhiger Wachheit befindet und bleiben kann. Das PNBDT ist ein psychologisches Untersuchungsmittel, individuelle Unterschiede im Verhalten des Neugeborenen und in seinem Befinden festzustellen. Es werden keine neurologischen Items benutzt. Klinische Erfahrungen mit dem PNBDT sind positiv und die Methode wird weiter verbessert und für die klinische Anwendung standardisiert.

Ein getrennter Teil der Methode ist ein Bericht der Mutter über das Gesamtverhalten des Neugeborenen, der auf dem Newborn Temperament Questionnaire (NTQ) aufgebaut ist. Wenn man den PNBDT zusammen mit dem NTQ verwendet, kann man das wirkliche Verhalten des Neugeborenen mit seinem affektiven Gesamtzustand vergleichen.

Introduction

Most of the historical and critical studies on methods that evaluate the behavior of neonates agree that no single method is optimal for all situations. They call attention to the necessity of adapting existing methods and creating new ones that integrate recent findings from research with new methodological approaches (St. Claire, 1978; Prechtl, 1982; Francis, Self, and Horowitz, 1989; Šulcová and Mrlinová, 1992). When constructing the Prague Newborn Behavior Description Technique (PNBDT). we took into account Prechtel's critical analysis (1982) of the field and tried to develop the most unobtrusive behavioral psychological method for evaluating neonates' behavior under natural conditions. The PNBDT evaluates the interaction of the mother and newborn child at breastfeeding, the mother's breastfeeding technique, the newborn's spontaneous behavior, and the newborn reactivity after breastfeeding. The PNBDT also provides information on a healthy newborn's level of well-being.

Healthy newborn is usually defined in terms of the absence of illness, pathology, deviation from the norm, and termed "physiological newborn". Our approach is in accord with that of Prechtl (1980) stressing the optimality of pre-, peri- and postnatal conditions, Emde's (1987) accent on emotional signals as important means of a newborn's communication with grown-ups, Odent's (1989) emphasis on of well-being as a criterion of the newborn's good health and, lastly the WHO definition of positive health as "a state of somatic, mental and social well-being".

A newborn's attainment of well-being is considered a prerequisite for his ability to concentrate on external stimuli. Weiss and Zelazo (1991) deem awareness

as the most sensitive indicator of homeostasis organization. The newborn informs us about his well-being by vocal and mimic manifestations of his emotions, and by changes in the quality and quantity of his gross motoric behavior. Well-being is the main theme of a newborn's emotional non-verbal communication immediately after his birth.

Development of the Method

In development of the method the following were analyzed:

1. Methods that evaluate the behavior of newborns (Graham Behavior Test for Neonates, Graham 1956; Graham Rosenblith Scales, Rosenblith 1961; Neonatal Behavior Assessment Scale NBAS, Brazelton 1973, 1984; Kansas Infant and Environment Observation Code KIEOC, Linn, Daily and Johnson, 1978; Fast Orienting Diagnostic Plan FODP, Katona 1983; Assessment of Behavior Patterns in Neonates, Riese 1983).
2. The Obstetric Optimality Measures (Prechtl, 1968, 1977).
3. The Assessment of Mother-Infant Sensitivity – AMIS, (Ainsworthm 1983) and AMIS supplement, (Krejčířová, 1990).
4. The Brazelton NBAS instructional videocassettes.
5. Recent findings in the field of early mother-child interaction research.
6. Videorecordings and ethograms of newborn's spontaneous behavior in the first hour of his life.
7. Videorecordings and direct observation of mother and newborn's behavior during and after breastfeeding on the 3rd, 14th and 30th day of life.

Items were chosen based on the naturalness of their occurrence within a newborn's activity. Neurological items, aversive items and items that required an observer to seriously disturb a newborn were excluded.

Formulation of the PNBDT structure is based on:

1. The measure of optimality concept based on:
   a) Anamnesis of the mother's gravidity and childbirth, natal anamnesis of the newborn and information gained through an interview with the mother.
   b) Data about the socio-economic status of the mother and child.
2. Actual situational context representing the external environment:
   a) The mother's breastfeeding technique.
   b) The mother's behavior toward the child before, at, and after the breastfeeding.
3. Behavior of a newborn during the breastfeeding.
4. Evaluation of the perceptual cognitive activities if and only if the child is in a natural state of waking.
5. Discrimination of the newborn's ten states.
6. Newborn's individual biorhythm and need for rest.

Inclusion of the breastfeeding technique evaluation was based on an assumption that mistakes in breastfeeding might cause not only breastfeeding failures but also cause negative mutual interaction between the mother and the new-

born, and consequently affect the newborn's behavior. We also observe the social communication between the mother and the newborn as was expected to considerably influence the latter's well-being.

We assume that the assessment of a newborn's behavior using the PNBDT will contribute not only to a standardized description of his behavior but also to a clarification of the relation between newborn behavior and breastfeeding technique. The naturalness of the situation in which the PNBDT is used and the unstressfulness of its technique is considered essential to a valid and reliable evaluation of a newborn's behavior.

The experimental version of the method, which contained 42 operationalized items and accompanying descriptions of examination strategies and evaluation instructions, was tested in a pilot study using a sample of 50 newborns and their mothers. The newborns were evaluated on the 1st, 14th and 30th day of the newborn's life. The chosen examination strategy proved useful. Nevertheless, some of the items have been reworded or completely revised and some new items have been added.

The newborn's behavior was found to be influenced by temperament in addition to the moments of their pre-, peri- and postnatal anamnesis. The PNBDT also contains items for a newborn's temperament and items for the assessment of the style of their actual behavior. To evaluate the newborn's modal behavior a mother report, the Newborn Temperament Questionnaire – NTQ, (Sulcová and Kožený 1994) was constructed. The NTQ has favorable psychometric parameters (Kožený and Sulcová 1994) and is suitable for experimental use.

An observer uses the PNBDT to evaluate a newborn's behavior while his mother uses the NTQ to evaluate his modal behavior. Comparison of the findings establishes a more complex picture of newborn's behavior and mother-child relationship. It is also expected that the NTQ will contribute to the verification of the content validity and calibration of some of the PNBDT items. On the basis of pilot study the PNBDT was modified into the present experimental version.

Description of the Experimental Version of PNBDT

The PNBDT has 70 items: 49 new items and 21 items taken from the NBAS. With the exception of 5 frequency items (smiles, crying, tremors, frights, sneezing and yawning), the 16 NBAS items were defined differently in the PNBDT.

The majority of the items used 5-point scale. Scales other than 5-point ones were used due to the spectrum of newborn's behavior and our effort to find a format, that would garantee maximum information.

The PNBDT has a tree-like structure:

I. Feeding (behaviour of mother and newborn)
   a) Breastfeeding
   b) Bottlefeeding
II. Perceptual-cognitive behavior
   a) Perception of social stimuli
   b) Attention
   c) Perception of non-social stimuli

III. Inner factors
   a) Irritability
   b) Physiological fragility
   c) Ability to establish homeostasis (well-being)

The newborn's state, which is considered to be of utmost importance in making reliable and valid measurement, is repeatedly assessed. We distinguished 10 states newborns: (a) 1–3 states of sleeping, (b) 4–7 states of quiet waking (alertness) with differing intensities of emotions and differing qualities of attentiveness, reactiveness, and motor behavior; (c) 7–10 states of restless waking with rising intensity of negative emotions and behavior disorganization.

The Strategy of Examination for the PNBDT

The examination takes the form of a friendly visit and begins by evaluating the newborn's state when the mother decides to communicate with him, embrace him and begin to breastfeed him.

We evaluate if and when the mother woke the child, the manner of social communication before and after the breastfeeding, the behavior of the newborn during breastfeeding, the complexity of the act and the response of the newborn – his visual, vocal and mimic reactions. Then we assess the mother's breastfeeding technique.

The codification of the newborn's state immediately follows the breastfeeding. If the child is not in a quiet waking state, we wait no longer then 30 minutes. Only then would we initiate a complex social communication and evaluate the child's reactions toward it. If his waking state and interest in stimuli continues, we apply the acoustic and visual stimuli – the face and the voice – and extra social stimuli like a small ball and a baby rattle, record the duration of the child's fixing on the presented stimulus and evaluate the quality of the child's attentiveness. Finally we encode the newborn's reaction to singing. Before breastfeeding if the newborn was quietly awake, we examined his perceptive cognitive activities before breastfeeding, provided that he was interested in the stimuli. If the newborn manifested disinterest or displeasure we discontinue the examination and let the mother feed the baby.

The observer was trained to synchronise his behavior with the newborn's state – the baby's interest, intensity of attention and fatigue. Interruptions in the examination allowed optimal conditions for the newborn's well-being and cooperation to develop.

During the examination the emotions are evaluated in their vocal and mimic manifestations, according to spectrum, modality and intensity. The frequency of smiles and weeping is evaluated independently.

During the examination the frequencies of such phenomena as hiccuping, sneezing, tremors and anxieties, energy exertion, relaxing, tiredness, uncooperativeness, maxima of the displeasure and self-comforting manoeuvres are recorded.

The items concerning nursing reactions are encoded while the child is in a quiet state. The mutual affection of the newborn and the mother is evaluated

summarily during the entire examination. We note all conspicuous activities that might influence the newborn's behavior.

After the examination the mother is given advice on any breastfeeding problem and on the psychological aspects of child care.

Preliminary Verification

The method was tested using a sample of 122 physiological newborns (67 boys and 55 girls). Data were collected at maternity hospital at the age of 3 days, and at home at the 14th and 30th day of life. During a short briefing the mothers were instructed on how to evaluate the modal behaviour of their children. One mother failed to provide the second assessment. The sample was selected based on the diagnosis by a neonatologist at the time of delivery.

The newborns' characteristics were as follows: Apgar score 1 min.: M = 9.1, SD = 0.87, range = 6–10; Apgar score 5 min: M = 9.8, SD = 0.48, range = 8–10; Apgar score 10 [min.: M = 9.9, SD = 0.2, range = 8–10, delivery duration: 1st stage: < 180 min. = 30, > 360 min. = 20, 2nd stage < 5 min. = 49, > 20 min. = 7, birth weight: M = 3399.18 g, SD = 461.1 g, range = 2180–4500, rooming-in: full = 83, partial = 27)

The mothers' characteristics: (age: M = 26.6, SD = 4.5, range = 18-41; education: elementary = 28, high school = 54, college = 40; primiparae = 64, primigravidae = 38, artificial abortion = 36; without obstetric medication = 40)

The method was subjected to psychometric item analyses using data from each of the three measurements. The findings are now being used to revise item content or/and improve rating scale.

Clinical Experiences with the PNBDT

The PNBDT schema was favorably accepted by mothers and newborns showed no stress reactions. The examination lasted between 30 and 90 minutes (on the average 45 minutes), the observer's active part took about 20 minutes.

Only rarely did mothers wake their newborns for breastfeeding during the first 3 days of children's age at maternity hospitals.

The first part of the PNBDT, which evaluates the breastfeeding technique and the newborn's behavior during feeding, presented no problems. The second part of the PNBDT might interfere with the beginning of the newborn's digestive process, which optimally occurs in a quiet state. If the child entered such a quite state we could stop the examination procedure and evaluate only the newborn's subsequent spontaneous behavior.

Wolf (1973) mentions that the cycle of nourishment influences vigilance. Wolf found that breastfed children are awake before feeding, while bottlefed children are awake after it. Our experiences are not wholly in accord with his findings. In the home environment, children woke up spontaneously before feeding – both the breastfed and bottlefed ones – and the majority wanted to eat immediately. Some of the breastfed children were awake before feeding, but did not signalize

hunger; these children were examined before feeding with the second part of PNBDT.

On the 14th and 30th day, the majority of newborns stayed awake after breastfeeding. The bottlefed ones behaved similarly. It is possible that mother interrupted the breastfeedings before the children were sufficiently satiated and that this feeling of insufficient satiation contributed to their wakefulness.

Newborn's reactions to singing were most interesting. Singing appeared to be the strongest social stimulus and a complex interaction and cognitive activities occurred when an embraced newborn was sung to. Singing also has quasi therapeutic qualities and is able to induce sleep. However, fatigued newborn revived in response to singing, watched the mother's face, especially her mouth movements, and often imitated them. The restless ones reacted by calming down, falling asleep, and sleeping quietly. Most of the newborns reacted very intensely and those reposed in the mother's arms often sought eye contact. The intensity of attention was surprising, nearing to a kind of hypnotic rapport. The perception of singing seems to us to be among the basic human needs. We therefore want to devote special attention to it in the future evolution of our method.

Conclusion

In developing the PNBDT the behavioral approaches toward the evaluation of the newborn's behavior were integrated and the paradigm of holistic methodology was applied.

The method has so far proven to be useful and generated considerable information about a newborn's behavior. Nevertheless, we realize that the PNBDT in its present form is still lacking in perfection. Besides the revision of item content, further testing and psychometric analyses of the PNBDT are necessary. Nonetheless, we consider the method a promising one and worthy of standardization and validation studies.

Adoption of the standardized PNBDT and NTQ might contribute to the particularization of newborn's behavior styles, to the advancement of breastfeeding technique and to the more sensitive differentiation of a neonate's health and state of well-being.

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