



## ORIGINAL ARTICLE

# Clinical application of the Newborn Behavioral Observation (NBO) System to characterize the behavioral pattern of newborns at biological and social risk ☆,☆☆

Marina Aguiar Pires Guimarães<sup>a,\*</sup>, Claudia Regina Lindgren Alves<sup>b</sup>,  
Ana Amélia Cardoso<sup>c</sup>, Márcia Gomes Penido<sup>b</sup>, Lívia de Castro Magalhães<sup>d</sup>

<sup>a</sup> Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, MG, Brazil

<sup>b</sup> Universidade Federal de Minas Gerais (UFMG), Faculdade de Medicina, Departamento de Pediatria, Belo Horizonte, MG, Brazil

<sup>c</sup> Universidade Federal de Minas Gerais (UFMG), Departamento de Terapia Ocupacional, Belo Horizonte, MG, Brazil

<sup>d</sup> Universidade Federal de Minas Gerais (UFMG), Programa de Pós Graduação em Ciências da Reabilitação, Belo Horizonte, MG, Brazil

Received 14 February 2017; accepted 2 May 2017

## KEYWORDS

Behavior;  
Child development;  
Preterm;  
Newborn

## Abstract

**Objective:** To compare the behavior of preterm newborns (PTNs) and full-term newborns (FTNs) using the Newborn Behavioral Observation (NBO) and to evaluate the mothers' experience when participating in this observation.

**Method:** This was a cross-sectional study performed at a referral hospital for high-risk births, involving mothers and neonates before hospital discharge. The mothers answered the sociodemographic questionnaire, participated in the NBO session, and evaluated the experience by answering the parents' questionnaire at the end. The characteristics of the PTN and FTN groups and the autonomic, motor, organization of states, and responsiveness (AMOR) scores were compared. Linear regression was performed to test the association of the characteristics of mothers and neonates with the scores in the AMOR domains.

**Results:** The NBO was performed with 170 newborns (eight twins and 77% PTNs). Approximately 15% of the mothers were adolescents and had nine years of schooling, on average. The groups differed regarding weight for gestational age, age at observation, APGAR score, feeding, and primiparity. The linear regression adjusted for these variables showed that only prematurity

☆ Please cite this article as: Guimarães MA, Alves CR, Cardoso AA, Penido MG, Magalhães LC. Clinical application of the Newborn Behavioral Observation (NBO) System to characterize the behavioral pattern of newborns at biological and social risk. J Pediatr (Rio J). 2017. <http://dx.doi.org/10.1016/j.jpmed.2017.05.014>

☆☆ Study carried out at Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, MG, Brazil.

\* Corresponding author.

E-mail: [marinapguimaraes@gmail.com](mailto:marinapguimaraes@gmail.com) (M.A. Guimarães).

<http://dx.doi.org/10.1016/j.jpmed.2017.05.014>

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**PALAVRAS-CHAVE**

Comportamento;  
Desenvolvimento  
Infantil;  
Prematuro;  
Recém-nascido

t remained associated with differences in the scores of the motor ( $p=0.002$ ) and responsiveness ( $p=0.02$ ) domains. No statistical difference was observed between the groups in the score attributed to one's own knowledge prior to the session ( $p=0.10$ ). After the session, these means increased in both groups. This increase was significantly higher in the PTN group ( $p=0.02$ ).

**Conclusions:** The NBO increased the mothers' knowledge about the behavior of their children, especially in mothers of PTNs, and identified differences in the behavior of PTNs and FTNs regarding the motor and responsiveness domains.

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### Aplicação clínica do *Newborn Behavioral Observation (NBO) System* para caracterizar o padrão comportamental dos recém-nascidos de risco biológico e social

**Resumo**

**Objetivo:** Comparar o comportamento de recém-nascidos pré-termo (RNPT) e a termo (RNT) utilizando a *Newborn Behavioral Observation (NBO)* e avaliar a experiência das mães em participar desta observação.

**Método:** Estudo transversal realizado em hospital de referência para partos de risco, envolvendo mães e neonatos antes da alta hospitalar. As mães responderam ao questionário sociodemográfico, participaram da sessão de NBO e ao final avaliaram a experiência respondendo ao questionário de pais. As características dos grupos de RNPT e RNT e os escores dos domínios autônomo, motor, organização dos estados e responsividade (AMOR) foram comparados. Realizou-se regressão linear para testar a associação de características das mães e neonatos com os escores nos domínios AMOR.

**Resultados:** A NBO foi realizada com 170 RN (oito gemelares e 77% pré-termo). Cerca de 15% das mães eram adolescentes e estudaram em média por 9 anos. Os grupos diferiram quanto ao peso para idade gestacional, idade na observação, APGAR, alimentação e primiparidade. A regressão linear ajustada para estas variáveis mostrou que apenas a prematuridade manteve-se associada a diferenças nos escores dos domínios Motor ( $p=0,002$ ) e Responsividade ( $p=0,02$ ). Não houve diferença estatística entre os grupos na pontuação atribuída ao próprio conhecimento antes da sessão ( $p=0,10$ ). Após a sessão estas médias subiram em ambos os grupos. Este aumento foi significativamente maior no grupo de RNPT ( $p=0,02$ ).

**Conclusões:** A NBO aumentou o conhecimento das mães sobre o comportamento dos filhos, principalmente para as mães de RNPT, e identificou diferenças no comportamento de RNPT e RNT nos domínios motor e responsividade.

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**Introduction**

Advances in neonatal intensive care have increased the chances of survival of newborns at risk, reinforcing the need to monitor their abilities and skills in the long term.<sup>1</sup> Consistent with a concept of the newborn as a passive being, who only reacted to environmental stimuli, the traditional assessment was based primarily on the physical examination, Apgar score, the so-called "primitive reflexes," and neurological evolution.<sup>2</sup> However, in the 1970s, new perspectives for the observation and understanding of child development emerged, based on the recognition of the rich variety of behaviors used by newborns to express their abilities and needs.<sup>3,4</sup>

Brazelton was one of the first to describe the repertoire of newborns' interacting abilities and their capacity to select stimuli, recognizing the newborn as a competent being, who gives signs that guide the parents' attitudes and

contribute to establish the affective bond.<sup>2</sup> Brazelton drew attention to the delicate balance between the physiological regulation systems, motor organization and alertness states, which provide support to the newborn's maintenance of attention and social interaction. Based on these premises, he created a neonatal behavior assessment system called the Neonatal Behavioral Assessment Scale (NBAS),<sup>2</sup> which allows mapping the newborn's ability to self-regulate and maintain effective social interactions.

Recently, the Newborn Behavioral Observation (NBO) system was created, being a simpler tool that maintained the conceptual richness of the NBAS, but shifting the focus from the diagnosis of disorders to the observation of the newborn's potentials and individuality. It is a family-centered resource, designed to describe the skills of the newborn, explicitly aiming to strengthen the relationship between parents and their children and to promote the development of a supportive relationship between professionals and families.<sup>5</sup>

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