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Parent-infant interaction as a mediator of the relation between neonatal risk status and 12-month cognitive development

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Abstract

The present study examined parent-infant interaction quality as a potential family mechanism through which the combination of perinatal and sociodemographic risks predicts cognitive development in LBW, VLBW, and full-term infants. Preterm LBW, VLBW and full-term infant-mother dyads were assessed when infants were 6 and 12 months post-term. Of the 117 infants seen at 6 months, 84 (72%) returned at 12 months (44 FT, 20 LBW, 20 VLBW). Level of neonatal risk was coded based on birthweight, Apgar scores, length of hospitalization and intubation, and presence of respiratory complications. At 6 months, mothers and infants were observed playing an interactional game which was scored for degree of reciprocity and engagement, and at 12 months, infant cognitive skills were assessed. Results indicated that, although maternal sociodemographic characteristics did not moderate the relation between neonatal risk and cognitive outcomes, quality of parent-infant interaction mediated the relation between neonatal risk and cognitive development. Reciprocal and engaging dyadic interactions significantly predicted higher cognitive scores, controlling for neonatal and maternal risks and the interaction between risks. © 2001 Elsevier Science Inc. All rights reserved.

Keywords: Low birthweight; Preterm; Infant-mother interaction; Cognitive development

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1. Introduction

Preterm low birthweight (LBW) and very low birthweight (VLBW) infants are at risk for developmental delays, particularly in their first years of life (e.g., Lee & Barratt, 1993; Magill-Evans & Harrison, 1999; Sansavini, Rizzardi, Alessandrini & Giovanelli, 1996; Wolke & Meyer, 1999). Moreover, degree of prematurity and severity of neonatal medical problems predict early developmental outcomes (Anderson et al., 1996; Creasey, Jarvis, Myers, Markowitz, & Kerkering, 1993; Landry, Denson, & Swank, 1997; Meisels, Plunkett, Pasick, Stiefel, & Roloff, 1987; Palta, Sadek-Badawi, Evans, Weinstein & McGuinness, 2000; Smith et al., 1996, 1999). For example, Korner et al. (1993) found that for infants born weighing less than 1500 g, level of neonatal complications continued to adversely affect development at 3 years. However, findings from the Infant Health and Development Program (IHDP) suggest that the relation between birth status and intellectual functioning is not direct (Liaw & Brooks-Gunn, 1993). In addition to perinatal medical risks, family variables are important predictors of developmental outcomes for preterm LBW and VLBW infants (Gyler, Dudley, Blinkhorn & Barnett, 1993; Korner et al., 1993; Lee & Barratt, 1993). Thus, further examination of potential family-level mediators and moderators of the relation between perinatal medical risks and infant cognitive outcomes is warranted. Whereas mediators refer to processes through which outcomes occur, moderators explain under what conditions outcomes occur (Baron & Kenny, 1986; Holmbeck, 1997).

The present study adds to the literature by examining parent-infant interaction quality as a potential mechanism through which the combination of perinatal and sociodemographic risks predicts the cognitive skills of full-term, LBW and VLBW infants. To account for relations among these variables, we propose a mediated moderation model (Baron & Kenny, 1986; Fig. 1). Although mediational models are suggested by transactional developmental theory, they rarely have been tested in the literature. In the present study, quality of parent-infant interaction was the potential mediator and maternal sociodemographic risk was the potential moderator of the relation between perinatal medical risks and infant cognitive development.

1.1. Sociodemographic factors as a moderator of neonatal risk

Transactional developmental theory (Sameroff & Fiese, 2000a, 2000b) and a growing body of empirical evidence suggest that biological and environmental risks interact over time to influence children's cognitive development (Escalona, 1984; Laucht, Esser, & Schmidt, 1997; Ricciuti & Scarr, 1990; Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987; Spiker, Ferguson, & Brooks-Gunn, 1993). Additional research examining the effects of cumulative risks on young children's development has found that, as the number of biological and environmental risks increase, cognitive outcomes decline (e.g., Sameroff, Bartko, Baldwin, Baldwin & Seifer, 1998). Risks related to the family context include parental education, maternal marital status, minority status, family size, and other variables (Sameroff et al., 1998). Liaw and Brooks-Gunn (1994) examined the effects of cumulative risks in families with preterm LBW infants and found that risk factors occurred more frequently in poor families, and as the number of risks increased, child IQ decreased (Liaw & Brooks-Gunn,

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