Title:
Behavioral Intervention With Maternal Participatory Guidance Improves Preterm Infant Outcomes

Rosemary C. White-Traut, PhD
Department of Women, Children and Family Health Science, University of Chicago - Illinois, Chicago, IL, USA

Session Title:
Maternal Education in Preterm Infants
Slot:
N 10: Sunday, 30 July 2017: 11:15 AM-12:00 PM
Scheduled Time:
11:15 AM

Keywords:
Development intervention, Infant behavior and growth and Preterm infant

References:
Medoff-Cooper, B., Shults, J., & Kaplan, J. (2009). Sucking behavior of preterm neonates as a predictor of developmental outcomes. *Journal of Developmental & Behavioral Pediatrics*, *30*(1), 16-22.

Pickler, R. H. (2004). A model of feeding readiness for preterm infants. *Neonatal intensive care: the journal of perinatology-neonatology*, *17*(4), 31.

Abstract Summary:
Intervening with the mother and the preterm infant during the initial hospitalization and the first month following hospital discharge is a promising strategy to support infant behavior, oral feeding, and infant growth; improve mother-infant interaction; and reduce infant illnesses.
Learning Activity:

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
1) Discuss infant behavioral cues prior to feeding and following feeding	Behavioral cues of infants: 1. Behavioral States 2. Orally Directed Behaviors 3. Engagement and Disengagement Behaviors 4. Hunger and Satiation Cues
2) Review the following responses: physiological, behavioral, feeding, mother-infant interaction, and health care utilization and cost following developmental interventions	Responses: 1. Behavioral Organization 2. Growth 3. Oral Feeding 4. Mother-infant Interaction 5. Health Care Utilization 6. Cost
3) Identify Strategies for teaching parents how to implement developmental interventions for their infants	Strategies for teaching parents: 1. Reading and responding to infant behavioral cures 2. Participatory guidance 3. Reinforce parent participation 4. Parents complete a return demonstration

Abstract Text:

Purpose: This completed randomized controlled trial of 198 premature infants born at 29-34 weeks gestation and their mothers examined the impact of the H-HOPE (Hospital to Home: Optimizing the Preterm Infant's Environment) intervention on infant behavior, infant feeding and growth during hospitalization, mother-infant interaction, and illness visits when the infants reached 6-weeks corrected age (CA). The research was guided by two models: Developmental Science and Adult Learning Theory.

Methods: Mother-infant dyads were randomly assigned to the H-HOPE intervention group or an Attention Control group. H-HOPE is an integrated intervention that included (1) twice-daily infant multisensory stimulation using the ATVV Intervention (auditory, tactile, visual, and vestibular-rocking stimulation) offered prior to feeding and (2) four maternal participatory guidance sessions by a nurse-community advocate team. Infant behavior was measured weekly during hospitalization via the proportion of alert states and the frequency of orally directed behaviors when infants were able to feed orally. Infant feeding was measured weekly during hospitalization by Medoff-Cooper's nutritive sucking apparatus and growth was determined by daily weight gain and weekly length. Mother-infant interaction was assessed after hospital discharge at 6-weeks CA using Barnard's Nursing Child Assessment Satellite Training–Feeding Scale (NCAST, 76 items) and Censullo's Dyadic Mutuality Code (DMC, 6-item contingency scale during a 5-minute play session). Illness visits from hospital discharge through 6 weeks CA were reported by the mothers.

Results: There were no differences between the groups at baseline for any of the dependent variables. The infant behavior data showed that by day 7, the intervention group exhibited a significantly higher mean frequency of orally directed behaviors when compared with the Attention Control group (12.6 vs. 7.1 pre-intervention, $p < 0.10$; 51.8 vs. 33.2 during intervention, $p < 0.10$; and 8.9 vs. 5.3 immediately prior to feeding, $p < 0.05$). Also on day 7, the H-HOPE intervention group exhibited a significantly higher proportion of time spent in an alert state during intervention (0.26 vs. 0.11, $p < 0.05$) and immediately after intervention (0.28 vs. 0.06, $p < 0.01$).

Infant feeding during hospitalization differed between the two groups. A quadratic trend was observed for infant feeding as measured by the number of sucks, the number of sucks per sucking burst, and a sucking maturity index. The intervention group experienced an increasing significantly improved oral feeding by day 7 (Model estimates for group by day: number of sucks - $\beta = 13.69$, $p < 0.01$; number of sucks per sucking burst - $\beta = 1.16$, $p < 0.01$; and the sucking maturity index $\beta = 0.12$, $p < 0.05$). Sucking pressure increased linearly over time, with significant between-group differences reached at day 14 ($\beta = 45.66$, $p < 0.01$). During hospital stay, the H-HOPE group infants gained weight more rapidly over time when compared with infants in the control group ($p = 0.04$) and grew in length ($p = 0.015$) more rapidly than control infants, especially during the latter part of the hospital stay.

After hospital discharge and when the infants reached 6-weeks CA, NCAST and DMC scores for the Control and H-HOPE groups were compared using *t*-tests, chi-square tests and multivariable analysis. Compared with the Control group ($n = 76$), the H-HOPE group ($n = 66$) trended toward higher NCAST scores overall and higher maternal Social-Emotional Growth Fostering Subscale scores and had significantly higher scores for the overall infant subscale and the Infant Clarity of Cues Subscale ($p < 0.05$). H-HOPE group dyads were also more likely to have high responsiveness during play as measured by the DMC (67.6% versus 58.1% of controls). After adjustment for significant maternal and infant characteristics, H-HOPE group dyads had marginally higher scores during feeding on overall mother-infant interaction ($\beta = 2.03$, $p = .06$) and significantly higher scores on the infant subscale ($\beta = 0.75$, $p = .05$) when compared to controls. Infants assigned to the H-HOPE group were also half as likely to have illness episodes (illness visit to the clinic, emergency department (ED) or hospital readmission) as control infants (OR = 0.46, 95% CI = 0.22, 0.95).

Conclusion: Intervening with both mother and preterm infant during initial hospitalization and the first month following hospital discharge is a promising strategy to support infant behavior, oral feeding, and infant growth, improve mother-infant interaction, and reduce infant illnesses following hospital discharge.