Breastfeeding Practices in the Neonatal Intensive Care Unit Before and After an Intervention

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THE NICU

- Medically complex environment
- Fragile and neurologically immature infants
- Health care professionals as primary caregivers
- Priority is life saving/medical interventions
Mothers of Infants in the NICU

- Separated from the infant
- Increased stress and anxiety
- Intimidated by the environment
- Unable to breastfeed in the traditional sense
Why are Breastfeeding and Breast Milk Feedings Critical in This Population

- Important part of mothering, despite the difficult environment
- Immediate health benefits for the infant
- Long term health benefits for the infant
- Developmental benefits for the infant
- Health benefits for the mother
Breast Milk and Benefits for Premature Babies

**DECREASES:**

- Risk of NEC, GER, ROP, respiratory infections (Hylander, 2001)
- Risk of A’s and B’s during oral feeds (Chen, 2000)
- Risk of sepsis and meningitis (Hylander, 2001)
- Morbidity and mortality (Hylander, 2001)
- Blood pressure in the teenage years (Singhal, 2001)
- Length of hospitalization and health care costs (Harrold, 2002)

**IMPROVES:**

- Gastrointestinal functioning (Hylander, 2001)
- Neurological maturity and IQ at 7-8 years of age (Smith, 2003; Gomez-Sanchiz, 2003)
- Developmental motor quotients at 18 months of age (Morley, 1988; Gomez-Sanchiz, 2003)
Benefits of Breastfeeding for the Mother

- Special bonding experience (Torgus, 1997)
- Decreased risk of breast and ovarian cancer (Lacey, 2002)
- Improved bone mineral density (Chantry, 2004)
- Faster pregnancy related weight loss (Dewey, 1993) and less postnatal weight gain (Rooney, 2002)
- Delayed ovulation (Rea, 2004)
- Less postpartum bleeding (Chua, 1994)
- Decreased risk of diabetes and rheumatoid arthritis (Rea, 2004)
Benefits of Breastfeeding for the Mother of a Hospitalized Infant

- Mother with improved sense of well-being: “the one thing that I can do for my baby” (Schanler, 1999)

- Quicker discharge of the baby enables the mom to function in her role as mother more quickly
Current Recommendations

- **AAP:**
  - Exclusive breastfeeding for 6 months
  - Continued breastfeeding until the infant is at least 12 months

- **WHO:**
  - Breastfeeding until the infant is at least 2 years of age
Predictive Factors of Breastfeeding

- Socioeconomic status (Mitra, 2004)
- Previous children but smaller family size (Mitra, 2004)
- Race (Mitra, 2004)
- Maternal age (Bueno, 2003)
- Maternal education (Bueno, 2003)
- Birth weight (Hwang, 2006)
- Perinatal medical condition (Espy, 2003)
- Admission into the NICU (Scott, 2006)
Barriers to Breastfeeding

- Perceived lack of family support (Scott, 2006)
- Early supplementation or first feeding of formula (Wheeler, 2000)
- Social withdrawal and isolation (Stewart-Knox, 2003)
- Functional problems (Bick, 1998)
- Perceived inadequacy of the milk supply (Arora, 2000)
- Intent to return to work (Arora, 2000)
- Maternal illness (Riskin, 2003)
- Perceived inconvenience (Zimmerman, 2001)
Barriers to Breastfeeding in the NICU

- **Stress and anxiety** *(Docherty, 2002)*
- **Lack of ad lib feedings and normal mother-infant contact** *(Black, 2000)*
- **Complex environment and medical interventions** *(Wheeler, 2000)*
- **Lack of a calm, comfortable and private environment** *(Wheeler, 1999)*
- **Oral motor/mechanical problems** *(Hill, 1994)*
- **Diminished milk supply** *(Arora, 2000; Colin, 2002; Callen, 2005)*
- **Support of health care professionals in the NICU** *(Berens, 2001; Spicer, 2001; Swanson, 2005)*
Health Care Professionals Can Disable or Enable the Breastfeeding Process in the NICU

- Mothers receive conflicting advice (Jaeger, 1997).
- HCPs lack education about lactation (Berens, 2001; Pantazi, 1998; Register, 2000)
- Education can affect attitudes and knowledge (Bernaix, 2000; Siddell, 2003; Swanson, 2005)
- HCPs can support or damage breastfeeding in the NICU (Ekstrom, 2005)
Need for Research

- No studies investigating breastfeeding outcomes following an educational initiative targeted at health care professionals
Breastfeeding Interventions Must be Specific to the NICU Infant

- Must be individualized
- Based on current literature
- Be realistic, given the environment
- Have minimal or no risk
Hypothesis

- A three pronged intervention will positively affect breastfeeding practices in very low birth weight infants admitted to the neonatal intensive care unit
Specific Aim

- The overall goal was to attempt to develop an effective intervention that would enable health care professionals to instruct and assist mother-infant dyads in the complex NICU environment.

- The purpose of this study was to test the efficacy of a 3-part intervention on improving breastfeeding practices in the NICU.
Intervention Plan

- Educational Initiative for HCPs
- Modifications to the individualized care plan: Breastfeeding pathway
- Educational booklet: NICU mothers
Proposed Interventions

- Early and consistent pumping
- First feeding at the breast
- Attempts at breastfeeding when infant not demonstrating physiological sequelae (usually around 30 EGA)
- Monitoring of infant responses
- Increasing attempts when benefit is greater than risk
Research Questions

- Is there a significant difference in breast milk feeding initiation in VLBW infants before and after implementation of the intervention?

- Is there a significant difference in the rate of breastfeeding in the hospital among VLBW infants before and after the implementation of the intervention?

- Is there a significant difference in breast milk feedings at discharge in VLBW infants before and after the implementation of the intervention?
Participants

- VLBW (<1500 grams) infants
- Admitted to the NICU for 7-120 days
- Achieved full gastric feedings
- No breastfeeding contraindications
- 82 in each group needed
Design

- Quasi-experimental
- Matching through cohort controls
- Pre-intervention group compared to post-intervention group
Independent Variable

- The 3 pronged intervention
Dependent Variables

- Breast Milk Feeding Initiation Rate
- Breastfeeding Rate
- Breast Milk Feeding At Discharge Rate
Procedures

- 6 week educational initiative:
  March 1, 2005-April 15, 2005
- “A Mother’s Gift” issued to new admissions starting March 1, 2005
- The modified ICP used in new charts starting on March 1, 2005
Data Collection

- Subjects recruited via hospital data base
- Retrospective chart review
  - Pre-intervention group-81 participants from April 15, 2004 to December 7, 2004
  - Intervention: March 1, 2005 - April 14, 2005
  - Post-intervention group-54 participants from April 15, 2005 to November 29, 2005
Further Data Collection Halted

- Long period of time had passed since the interventions
- Additional interventions to be implemented
- New power analysis
Group Comparisons

- ANOVA for continuous variables
- Nonparametrics if assumptions violated
- Chi-square for dichotomous variables
- Ranked Bonferroni adjustment
Results

- 88 (63%) of health care professionals participated in the educational initiative.
- ICP-Implementation problems/lack of use.
- First feeding at the breast.
- “A Mother’s Gift”-admission paperwork.
- Nursing administrator’s observations.
## Demographics

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<th>Race (Black)</th>
<th>Maternal Age</th>
<th>Marital Status (not married)</th>
<th>Transferred Instead of DC Home</th>
<th>LOS</th>
<th>Birth Weight</th>
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Results Per Research Question

- Is there a significant difference in breast milk feeding initiation in VLBW infants before and after implementation of the intervention plan?
Breast Milk Feeding Initiation Rate

- Pre-Intervention Group 74.1%
- Post-Intervention Group 85.2%
- Pearson’s Chi-Square (p= .124)
- Odds Ratio 2.013
- Odds Ratio CI .818 to 4.952
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<tr>
<td>Post-intervention group</td>
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Is there a significant difference in the rate of breastfeeding in the hospital among women with VLBW infants hospitalized in the NICU before and after the implementation of the intervention plan?
Breastfeeding Rate

- Mean in pre-intervention group was .059
- Mean in post-intervention group was .138
- Mann-Whitney (p = .011)
- Significant differences across groups
Dichotomized Variable to Ever Breastfed

- Pre-intervention group 25.9%
- Post-intervention group 44.4%
- Pearson’s Chi-Square (p=.025)
- Odds Ratio 2.286
- Odds Ratio CI of 1.1 to 4.750
Is there a significant difference in breast milk feedings at discharge in VLBW infants before and after the implementation of the education plan?
Breast Milk Feeding at Discharge Rate

- Pre-Intervention Group 35.8%
- Post-Intervention Group 40.7%
- Chi Square (p=.562)
- Odds ratio 1.233
- Odds ratio CI .607 to 2.502
Conclusion

- Partial support of the intervention
- Positive trends across variables
- Evidence of increased breastfeeding
- Lack of significant change across all variables as hypothesized
- A multifaceted approach may be indicated
The Intervention Had an Effect on a Very Important Variable

- Diminished milk supply is a significant barrier
- Maternal stress
- Oxytocin
- Mothers given some control of care
Contributions to the Literature

- Breast milk feeding initiation rates (74% and 85%) comparable
  - 64% (Byrne, 1996)
  - 72.9% (Meier, 2004)
  - 83% (Yip, 1996)

- Breast milk feeding at discharge rates (36% and 41%) comparable
  - 38% (Yip, 1996)

- Education about lactation affects HCP knowledge and support of the breastfeeding process (Siddell, 2003; Ekstrom, 2005)

- Although HCP behavior and knowledge were not measured, this research concludes that there are positive breastfeeding outcomes following the intervention
Main Limitations

- Intervention did not have a strong enough effect
- Lack of compliance
- Lack of formal measurement of health care behavior change and implementation
Limitations

- Inadequate time frame
- Inability to control for other changes in the environment
- Lack of participation by key decision makers
- Which intervention fostered change
- Lack of a randomized and larger sample
Conclusions

- Significant benefits of breast milk
- Challenges in the NICU
- Partial support of the intervention
- Breastfeeding in the NICU is not simply a “personal decision”
- More studies are needed