

Himalayan children than in those living in the UAE ( $70.2 \pm 15.2$  mm Hg vs  $62.2 \pm 8.8$  mm Hg, respectively;  $P < .001$ ). A higher proportion of Himalayan children had prehypertension (24.7%) and hypertension (15.1%), respectively, compared with their counterparts in the UAE (9.7% with prehypertension and 3.9% with hypertension).

**CONCLUSIONS:** A difference of 3000 m in altitude was associated with higher SBP and DBP in these children aged 6 to 18 years.

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## A “NEC Free NICU” Through Breastfeeding Quality Improvement Project (QIP)

**BACKGROUND AND OBJECTIVES:** Breastfeeding offers the best nutritional support for newborn infants. The value of breast milk in reducing the incidence of necrotizing enterocolitis (NEC) among premature infants admitted to the NICU has been reported. Ireland has one of the lowest breastfeeding rates in the developed world, however, and pursuing quality improvement projects (QIPs) aimed at improving use of breast milk among premature infants could be challenging. Our goals were to: (1) improve breast milk exposure of extremely low birth weight infants in the NICU from 80% to 100% over a 2-year period and among very low birth weight infants from 60% to 80% during the same period; (2) reduce the incidence of NEC in our NICU to a level below that reported by other network centers in Ireland benchmarked in the Vermont Oxford Network; and (3) improve the breastfeeding culture of our unit by ensuring the sustainability of a QIP.

**METHODS:** A QIP was commenced in January 2011 with a clear goal statement and time lines, as well as agreed and quantified written goals. Primary and secondary drivers were established and Plan-Do-Study-Act cycles initiated for demonstrating “small improvements” and acquiring “buy-in” from the medical and nursing staff as well as the parents of premature infants. The World Health Organization’s definition for the mother’s own milk and donor breast milk and modified Bell stage IIA or above for NEC were the denominators. The project was conducted in the tertiary NICU attached to University Maternity Hospital, Limerick, Ireland, which has an in-birth rate of 5000 per year. Approval of the hospital audit committee was obtained. During the project, senior medical and nursing teams of the unit as well as major clinical guidelines remained unchanged. Results of the study were analyzed by using SPSS version 18.

**RESULTS:** In a country with a low national breastfeeding rate, we found that 100% breast milk exposure to extremely low birth weight infants and 80% uptake by very low birth weight infants could be established through a QIP. For the first time in the history of our unit, in 2013, we had no NEC; the information is now uploaded to the Vermont Oxford Network. Our post-QIP staff surveys show evidence of sustainability of the project.

**CONCLUSIONS:** Through the adaptation of quality initiatives, breastfeeding rates among premature infants could be optimized, even in countries with traditionally low breastfeeding rates. Such low-cost interventions could significantly improve morbidity among premature infants, perhaps more than generally appreciated, as evidenced by our NEC-free tertiary unit.

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## Zinc and Copper Concentrations in Breast Milk During the First Nine Months of Lactation: A Longitudinal Study

**BACKGROUND AND OBJECTIVES:** A wide variation in the composition of breast milk has been reported from various countries. The aim of this study was to evaluate zinc (Zn) and copper (Cu) concentrations in the breast milk of lactating mothers as a function of lactation time and the relationship between these concentrations and the characteristics of mother–infant dyads.

**METHODS:** Mother–infant dyads were recruited immediately at the second week postpartum. Inclusion criteria were as follows: (1) gestational age  $\geq 37$  weeks; (2) birth weight  $\geq 2500$  g; and (3) no chronic illness in the infant or mother. Anthropometric measurements of the mother–infant dyads were taken. Maternal hemoglobin was measured at week 2 and month 4 postpartum. The samples of human milk were collected postpartum at week 2 and months 2, 4, and 9 postpartum. Zn and Cu concentrations were determined by using an atomic absorption spectrophotometer. Data were presented as mean  $\pm$  SD.

**RESULTS:** The mean concentrations of Zn and Cu ( $n = 172$ ) were  $4.84 \pm 2.24$  mg/L and  $452 \pm 129$   $\mu$ g/L, respectively, at week 2. There was a correlation between Zn and Cu concentrations at week 2. There was a significant reduction ( $P < .05$ ) in Zn and Cu concentrations at 4 months’ postpartum ( $n = 108$ ;  $4.88 \pm 2.40$  mg/L and  $453 \pm 123$   $\mu$ g/L

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