Pediatric RESEARCH

COMMENT

We want our families in the NICU!

Nuria Boronat[1,2], Amparo Escarti[3] and Máximo Vento[1,2]

Pediatric Research (2020) 88:354–355; https://doi.org/10.1038/s41390-020-1000-9

For unto us a child is born, for unto us a son is given.

Isaiah IX 6

Mothers separated from their young son, soon lost all interest in those whom they were unable to nurse or cherish.

Pierre Budin. The Nursling. London. Caxton Publishing Co., 1907.

The emotional tie between parents and infant begins not just after birth but is a continuum that starts during pregnancy and goes far into later childhood and adolescence. The terms bonding, attachment, eye-to-eye contact, nesting, rooming-in, sensitive period or early discharge were coined in the 1970s among others by Marshall H. Klaus and collaborators. In their seminal paper, Klaus et al. showed how mothers, allowed for an extended physical contact with their newborn infants, were more reluctant to leave their babies with someone else, were more fondling and pendent of their children during medical examinations, established earlier and easier eye-to-eye contact, and showed a great soothing behavior.[1]

The term *bonding* is used to describe the process of establishing a relation between parents and their infant. *Attachment* can be defined as an emotional connection that develops between an infant and the primary caregiver. An adequate bonding and parental attachment behaviors are crucial for the infants' physical, psychologic and emotional health and survival.[2] Two main steps of attachment are *Touching* and *Caregiving*. The behavior of *touching* is important to the adult as a means of tactile and sensory knowledge of the infant. Holding and cuddling the infant are significantly different from touching and exploring. *Caregiving* is the final and most important step of attachment for psychic closure of the task of bonding. Personal needs for comfort, maintenance of homeostasis and relief from painful experiences are the infant expectations of the relationship with caregivers.[2] Hence, care given by parents provides the ideal environment because infants learn and react to caregiving behaviors and develop synchrony with the parents.[3]

In the last decade, especially in high-income countries, the rate of prematurity and the survival of extremely preterm infants with associated severe clinical conditions such as bronchopulmonary dysplasia or severe neurologic injury has substantially increased.[4] These patients require prolong hospitalization and are subjected to a wide range of medical and/or surgical procedures. Undoubtedly, the birth of a sick newborn with an uncertain future and the consequent family disruption represents a stressful event that causes a period of psychologic disorganization. In this scenario, the family must master the normal developmental process of parenthood. Their feelings of alienation and frustration may result in a delay in the parenthood process, depression and anxiety and affected perceptions of how they see themselves as parents.[5] It has been shown that both the family´s functioning and its adaptation to stress have important consequences in the relations between parents, from the parents with the infant, and upon the infant's later development.[6,7]

A crucial task of the perinatal health-care team is to assist families to maximize their growth, adaptation and reorganization during their stay at NICU. By providing appropriate supportive interventions like family-centered policies (collaborative model of family advocacy and empowerment), the team can positively influence the family's coping and a healthy parent−child relationship. Parents' feelings of competency must include planning and providing developmental care and be able to discuss and participate in decision-making about their infant. Thus, they reduce their anxiety, allow for earlier discharge, and ensure an adequate provision of appropriate follow-up program adhesion.[8] Parent engagement and empowerment within the NICU widely differs between different countries and cultures; however, the steps needed to achieve a global development of the infants and emotional equilibrium of the parents are quite coincident between programs (see Fig. 1).[9]

In the current issue of *Pediatric Research*, Toivonen et al.[10] evaluate a family-care-centered (FCC) model applied in Finland and the effects of educational intervention on it. This study involved six level II and two level III NICUs and evaluated the quality of FCC before and after Close Collaboration with Parents Training Program implementation. The categories of family-centered care, as defined by Bliss, were evaluated: (1) active care by parent and staff, (2) parent and family support, (3) communication, (4) developmental care, (5) empowered decision-making, (6) facilities, (7) guidelines and policies, (8) staff skills and training, (9) information provision, and (10) service improvement and parent involvement. Units assessed their caring culture by rating themselves on a red−amber−green scale. The proportion of criteria rated as green increased (staff 55−76% ($p = 0.0004$), parents 39−70% ($p = 0.050$)) in the group of eight units. Proportion of red criteria decreased (staff 10 to 4% ($p = 0.0004$) and parents 12 to 2% ($p = 0.038$)) as well as amber criteria did in staffs' evaluation (median 38 vs. 20%, $p = 0.004$). The most remarkable result by category analysis was the empowering decision-making, whose result increased in both groups (staff 2.42 −2.66 ($p < 0.0001$), parents similar results). Despite the small sample size and lack of control group, results showed that Close Collaboration with Parents Training Program achieved a mutual partnership between parents and staff, increasing parent's participation in all aspects of care including decision-making.

Methodological limitations are difficult to obviate in family-centered research. Blinding studies that imply interventions with

[1]Division of Neonatology, University and Polytechnic Hospital La Fe, Valencia, Spain; [2]Neonatal Research Group, Instituto de Investigación Sanitaria La Fe, Valencia, Spain and [3]Department of Social Psychology, University of Valencia, Valencia, Spain
Correspondence: Máximo Vento (maximo.vento@uv.es)

Received: 13 May 2020 Accepted: 22 May 2020
Published online: 5 June 2020

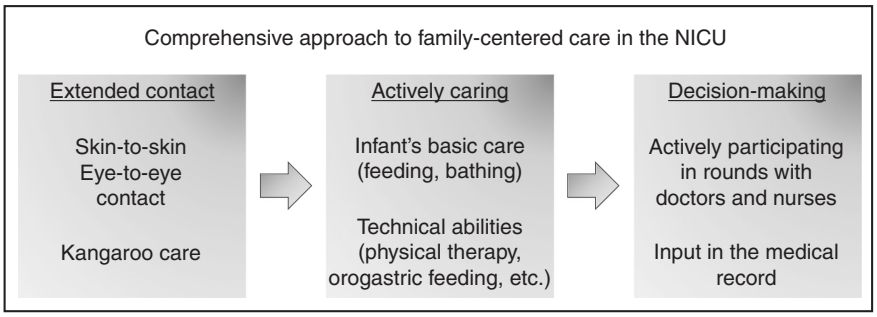

Fig. 1 Comprehensive approach to family-centered care in the neonatal intensive care unit (NICU). The scheme represents the different stages of interventions included in a comprehensive approach to family-centered care in babies admitted to the NICU.

parents and babies are very difficult and often raise ethical concerns among nurses, doctors, and even parents. There are some alternatives such as using a cross-over design with a prespecified washout period or randomizing some NICUs to the intervention and others not. However, these options are considerably difficult to put into practice. In addition, the items to be completed by the participants in the study by Toivonen et al.[10] were rather subjective and represent an added difficulty to keep the equipoise within the research team. Finally, the permanence of the positive results of the program will probably require to schedule reinforcement sessions. Despite these limitations, we agree with Toivonen et al.[10] that parents should be given a relevant role and a bundle of responsibilities for the development of services to better implement FCC.

We conclude that there are many interventions that a perinatal health-care team can employ to assist parents of a newborn admitted to the NICU. An adequate teaching of caregiving skills that enables parents to develop a sense of competence and empowerment is extremely important. In addition to tasks of care, parents should participate in planning and providing developmental care as well as in decision-making, discharge plan, and follow-up arrangements.

ACKNOWLEDGEMENTS

M.V. and N.B. pertain to the RETICS Red SAMID funded by the PN 2018−2021 (Spain), ISCIII- Sub-Directorate General for Research Assessment and Promotion and the European Regional Development Fund (FEDER), reference RD16/0022/0001.

AUTHOR CONTRIBUTIONS

M.V., N.B. and A.E. drafted the manuscript and approved its final version.

ADDITIONAL INFORMATION

Competing interests: The authors declare no competing interests.

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

REFERENCES

1. Klaus, M. H. et al. Maternal attachment. Importance of the first post-partum days. *N. Engl. J. Med* **286**, 460–463 (1972).
2. Merenstein, G. & Gardner, S. in *Merenstein & Gardner's Handbook of Neonatal Intensive Care* 8th edn (ed. Mosby, E.) (Mosby-Elsevier, 2016).
3. Sullivan, R., Perry, R., Sloan, A., Kleinhaus, K. & Burtchen, N. Infant bonding and attachment to the caregiver: insights from basic and clinical science. *Clin. Perinatol.* **38**, 643–655 (2011).
4. Lui, K. et al. Trends in outcomes for neonates born very preterm and very low birth weight in 11 high-income countries. *J. Pediatr.* **215**, 3240.e14 (2019).
5. Feldman, J. F. & Eidelman, A. Maternal postpartum behavior and the emergence of infant-mother and infant-father synchrony in the preterm and full-term infants: the role of neonatal vagal tone. *Dev. Psychobiol.* **49**, 290–302 (2007).
6. Rautava, P., Lehtonen, L. & Helenius, H. Effect of newborn hospitalization on family and child behavior: a 12 year follow up. *Pediatrics* **111**, 277 (2003).
7. Winston, R. & Chicot, R. The importance of early bonding on the long-term mental health and resilience of children. *Lond. J. Prim. Care (Abingdon)* **8**, 12–14 (2016).
8. Saenz, P. et al. Psychological stress of parents of preterm infants enrolled in an Early Discharge Programme from the Neonatal Intensive Care: a prospective randomised trial. *Arch. Dis. Child.—Fetal Neonatal Ed.* **94**, 98–104 (2009).
9. Umberger, E., Canvasser, J. & Hall, S. L. Enhancing NICU parent engagement and empowerment. *Semin. Pediatr. Surg.* **27**, 19–24 (2018).
10. Toivonen, M., Lehtonen, L., Löyttyniemi, E., Ahlqvist-Björkroth, S. & Axelin, A. Close collaboration with parents intervention improves family centered care in different neonatal unit contexts - a pre-post study. *Pediatr. Res.* (2020). https://doi.org/10.1038/s41390-020-0934-2. [Epub ahead of print].