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Kangaroo supported diagonal flexion positioning: New insights into skin-to-skin contact for communication between mothers and very preterm infants

Le peau-à-peau en flexion diagonale soutenue

A. Buil[a,d,*], I. Carchon[b], G. Apter[c], F.X. Laborne[a], M. Granier[a], E. Devouche[c]

[a] Centre hospitalier sud francilien, 116, boulevard Jean-Jaures, 91106 Corbeil Essonnes cedex, France
[b] Ecole Pratique des Hautes Etudes, Laboratoire CHART, 4-14, rue Ferrus, 75014 Paris, France
[c] EPS Erasme, Laboratoire RePPEr, 14, rue de l'Abbaye, 92160 Antony, France
[d] Université Paris Descartes, Laboratoire LPPS, EA4057, 71, avenue Edouard-Vaillant, 92774 Boulogne Billancourt, France

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Summary

Objective. Skin-to-skin contact shows benefits in the relationship developed between a mother and her premature infant. In the skin-to-skin session, face-to-face exchanges are impossible in vertical infant positioning. We therefore undertook an observational, prospective, single-center study using kangaroo "supported diagonal flexion" (SDF) positioning. The first aim was to evaluate the safety of kangaroo SDF positioning compared to the usual vertical positioning. The second aim was to evaluate SDF positioning on early communication between the mother and her infant and to improve their well-being.

Participants and setting. Fifteen mothers and their very premature infants (birth 26 < 32 weeks' gestation) were assigned to one of the two kangaroo positioning modes, either the current vertical positioning (n = 7) or SDF positioning (n = 8).

Design. Physiological variables and critical events were recorded before, during, and after ten successive skin-to-skin contact sessions. The first and last sessions were videotaped to allow later behavioral measurements. Mothers' risk for depression and feelings about the way they experienced communication with their infant were assessed through questionnaires.

Results. In terms of the infant's physiology, no negative effects were associated with SDF positioning in comparison with the usual vertical positioning. SDF positioning led to fewer disorganized gestures, negative vocalizations, and drowsiness, in favor of more deep sleep. SDF led to more mother–infant eye-to-eye contact as well as maternal vocalizations, smiles, and caressing, although these

Résumé

Introduction. Le peau-à-peau est bénéfique à la relation entre la mère et le nouveau-né prématuré. Il est réalisé habituellement en position verticale qui présente l'inconvénient de rendre difficile l'interaction visuelle entre la mère et l'enfant. Nous avons mené une étude observationnelle prospective et monocentrique. Notre premier objectif était de vérifier qu'une nouvelle installation, la flexion diagonale soutenue (FDS) était physiologiquement sûre par rapport à l'installation habituelle. Le second objectif était d'évaluer l'hypothèse d'une meilleure interaction visuelle, au sein des interactions précoces, et un bien-être respectif de la mère et du prématuré, avec l'installation FDS.

Méthode. Quinze mères et leurs bébés nés très prématurément (entre 25 et 32 semaines d'aménorrhée), hospitalisés dans un même centre, ont bénéficié du mode d'installation vertical (n = 7) ou du mode FDS (n = 8). Les paramètres physiologiques et événements critiques ont été enregistrés avant, pendant et après chacune des 10 séances successives de peau-à-peau. Les interactions ont été filmées à la première et dernière séance. Le bien-être a été évalué chez la mère par un auto-questionnaire de risque de dépression et chez le prématuré par son comportement.

Résultats. Chez le prématuré, aucune différence physiologique n'a été observée entre les deux types d'installation. L'installation FDS a conduit à moins d'agitation motrice, moins de vocalisations négatives, moins de somnolence, plus de sommeil profond que l'installation verticale. Chez la mère, l'installation FDS a conduit à plus d'attention

* Corresponding author.
Centre hospitalier sud francilien, service de médecine néonatale, 116, boulevard Jean-Jaures, 91106 Corbeil Essonnes cedex, France.
e-mail: audebuil11@gmail.com (A. Buil).

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differences did not reach significance. The score for the risk of postnatal depression decreased significantly between the first and the last session in the SDF group, whereas it did not change in the vertical positioning group.

Conclusion. These results support the idea that the kangaroo SDF positioning technique is physiologically safe, has obvious immediate benefits on mothers' infant-directed communicative behaviors, and respects the baby's naturally flexed and asymmetrical tonic neck posture. It is an innovative, inexpensive, easy-to-use technique in daily practice, by all healthcare professionals working in a neonatal intensive care unit. These data suggest that the current kangaroo positioning technique could be improved. More studies are needed to confirm the benefits and safety of the kangaroo SDF positioning in larger groups of preterm infants.

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visuelle, de vocalisations et de sourires dirigés vers son enfant et un risque de dépression maternelle diminué, par rapport à l'installation verticale.

Conclusion. Ces résultats montrent que l'installation FDS semble physiologiquement sûre. Elle a des effets positifs immédiats sur les premières interactions mères–prématurés et respecte la posture naturellement fléchie et asymétrique adoptée par le nouveau-né. C'est une technique psychomotrice innovante, non coûteuse et facilement reproductible dans la pratique quotidienne des professionnels en médecine néonatale. Ces données suggèrent que la technique de positionnement en peau-à-peau pourrait être améliorée. D'autres études doivent confirmer la sécurité et les bénéfices de l'utilisation de l'installation FDS auprès d'un échantillon plus important de grands prématurés.

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1. Introduction

Numerous parents experience feelings of distress after the birth of a preterm infant. They are permanently preoccupied by the health status of their child, unable to build early emotional relationships as parents of healthy full-term babies would. When interactions between specific risk and protective factors were studied, there was evidence of a buffer effect of a successful early mother–child interaction [1–3]. Skin-to-skin contact is currently the only relational multisensory care method offered to both mother and infant immediately after birth in neonatal intensive care units (NICUs). Skin-to-skin contact is a situation that is suitable for consistent and reciprocal interaction. Based on the Kangaroo Mother Care (KMC) program included in the Newborn Individualized Development Care Assessment Program (NIDCAP), such relational care has numerous well-known positive effects on the development of premature infants [4]. Intermittent KMC or skin-to-skin care (for short periods, once or a few times per day and for a variable number of days) is commonly employed in high-tech NICU settings [5]. Recent studies have shown benefits in infants at the cardiorespiratory level; in thermic, glycemic, and hormonal regulation; in brain development, and at the neurobehavioral level; as well as on parental perceptions, representations, and behaviors and the infant's psychomotor development in the first 6 months of life [6,7]. Feldman et al. [7] pointed out the influence of skin-to-skin contact on the maturation of the autonomic nervous system and the establishment of circadian rhythms in premature infants. Early skin-to-skin contact may foster vulnerable newborn children's adaptation to extrauterine life, enhance short- and long-term maternal (parental) care, and initiate early positive interactions [7,8]. The positive effects of skin-to-skin contact–not only on the infant's development but also on the parents' practices and perceptions during the first 6 months of life–are now well-known [7].

Skin-to-skin contact is suitable for consistent and reciprocal interaction, but because it developed in NICUs throughout the world, following common major guidelines, its specific organization depends on the country and the NICU. Nyqvist et al. [5] specified the necessary extension to settings with high levels of resources and technology. A team-training approach is needed to reduce the adverse effects inherent to any practice [8,9]. In the KMC practical guide, the World Health Organization [10] (p. 21) described the kangaroo position: "The head, turned to one side, is in a slightly extended position. The top of the binder is just under the baby's ear. This slightly extended head position keeps the airway open and allows eye-to-eye contact between the mother and the baby. Avoid both forward flexion and hyperextension of the head. The hips should be flexed and extended in a 'frog' position; the arms should also be flexed." More recently, the Committee of the first European conference and 7th international workshop on KMC reported that the baby's frontal position on the mother's chest may be vertical or semi-reclined, and that the head should be turned sideways and upright, but not flexed or extended [5]. Because the kangaroo position is also currently used in temporary care in high-tech NICUs, a considerable lack of homogeneity in KMC practice can be observed. For example, in our NICU, the baby was positioned vertically, inside the mother's clothes, and mothers often complained about the impossibility of face-to-face exchanges, because the vertical positioning on their chest did not favor eye-to-eye contact (*fig. 1*). Therefore, mothers sometimes preferred an arm-holding cuddle. In our NICU, we decided to address this issue of early mother–infant communication and implemented a new position based on a flexed body axis, the infant positioned diagonally on the mother's chest, and supported by a stretchy baby wrap (*figs. 1e and f*). This position proposed by the psychomotor therapist in our NICU was designated as supported diagonal flexion (SDF) kangaroo positioning. Mothers were therefore less preoccupied by the fear of the

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