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Heart Rate Variability Responses of a Preterm Infant to Kangaroo Care

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Objective: To examine the effect of kangaroo care on heart rate variability in a healthy preterm infant.

Design: Case study.

Setting: Private room on a postpartum unit.

Participant: A mother–preterm infant dyad.

Intervention: Kangaroo (skin-to-skin) care.

Main Outcome Measure: Heart rate variability, a noninvasive measurement of the sympathetic and parasympathetic components of the autonomic nervous system's influence on heart rate.

Results: Heart rate variability, especially the parasympathetic component, was high when the infant was fussy in the open crib, indicating increased autonomic nervous system activity. With kangaroo care, the infant fell asleep, and both sympathetic and parasympathetic components of heart rate variability decreased.

Conclusions: The wide fluctuations in the parasympathetic component of heart rate variability suggest immaturity of the sympathovagal response. Overall, kangaroo care produced changes in heart rate variability that illustrate decreasing stress. *JOGNN*, 34, 689–694; 2005. DOI: 10.1177/0884217505281857

Keywords: Behavior—Heart rate—Kangaroo care—Premature—Variability

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Measurement of heart rate variability (HRV) provides a noninvasive evaluation of the autonomic regulation of heart rate rhythmicity and is uniquely

appropriate to study the immature autonomic system's influence on cardio-respiratory control in preterm infants. Kangaroo care (KC), the placement of an infant in prone position and skin to skin on the mother's chest, has been shown to have many benefits for the infant and mother. Benefits to the mother include reduced anxiety, reduced breast engorgement postpartum, and longer breastfeeding duration (Shiau, 1998) as well as improved breastfeeding exclusivity (Mikiel-Kostyra, Mazur, & Boltruszko, 2002). Mothers and fathers who participated in KC in the neonatal nursery used more affectionate touch with their infants compared to mothers and fathers who did not participate in KC (Feldman, Weller, Sirota, & Eidelman, 2003). Among preterm infants, KC has promoted optimal temperature regulation (Bier et al., 1995; Chwo et al., 2002; Cleary, Spinner, Gibson, & Greenspan, 1997; Ludington-Hoe, Nguyen, Swinth, & Satyshur, 2000), stability in respiratory efforts (Bier et al., 1995; Cleary et al., 1997; Ludington-Hoe, Anderson, Swinth, Thompson, & Hadeed, 2004), and increases in quiet sleep (Chwo et al., 2002). Another physiologic benefit of KC may be to promote autonomic nervous system regulation in preterm infants (Feldman & Eidelman, 2003). The purpose of this case study was to examine the HRV responses of one preterm infant to a KC experience with his mother.

Heart rate, measured by counting the heart beats per minute, is a net effect of the decelerating influence of the vagal (parasympathetic) fibers and the accelerating influence of the sympathetic fibers on the inherent rhythmicity of the heart's sinoatrial

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