Benefits of Skin-to-Skin Contact during the Neonatal Period- Possible prevention of Immediate Harmful Stress to improve Future Health

Tomas J Ekstrom*

Department of Clinical Neuroscience, Sweden

Submission: February 22, 2017 ; Published: March 23, 2017

*Corresponding author: Tomas J Ekstrom, Department of Clinical Neuroscience (CNS), K8, Neuro Ekström, I8:00, Karolinska University, Solna, 17176 Stockholm, Sweden, Email: Malin.Almgren@ki.se

Introduction

Immediately at birth, the preterm infant needs support through the transition from the intrauterine environment to the very different extraterine life. During the first 24 hours after delivery the neonate experiences the most vulnerable period, since major physiological adjustments are required for survival [1]. During this initial phase, the infant may need support in establishing regular breathing, and maintaining normal body temperature and blood glucose levels to avoid potentially life-threatening situations. Methods for initial stabilization of the preterm infant include ventilation, provision of oxygen and intravenous nutrition and temperature regulation through radiant warmers, warm beds or incubators [2]. Kangaroo mother care (KMC) or skin-to-skin contact (SSC) is a successful way of caring for stable low-birth-weight infants, by placing the naked baby on the mother’s chest. Despite its well documented benefits and recommendations by WHO it is not always implemented.

Background Skin-to-Skin Contact

In 1988 Bergman et al. [3] performed a study in a Zimbabwe hospital, where there was no equipment for caring for neonates, and no referral facilities. Survival of infants between 1000-1500g had been as low as 10% in the previous 4-year period. Based on literature available on Kangaroo Mother Care (KMC) from Colombia, a modification of this intervention was started as care for low birth weight infants. Continuous skin-to-skin contact was initiated from birth or from admission in all low birth weight infants. The infants were breastfed or fed by a nasogastric tube and given prophylactic antibiotics. The overall survival of babies 1000g to 1500g improved dramatically from the above 10% to 50%, and survival of infants 1500g to 2000g improved from 70% to 90%, Figure 1. In another study, a randomized control study, stable neonates with birth weight 1200-2199g were either assigned SSC or conventional care [4]. Temperature and cardio-respiratory scores were monitored during 6 h after birth. At six hours, 100% of the SSC group showed perfect stability scores, compared to 46% of the conventional care group.

Current SSC practice

In addition to increased survival, SSC of low birth weight infants is reported to have important effects including increased breastfeeding and better mother-infant bonding in comparison to conventional care (incubators) with parent infant separation [5]. The immediate SSC has also a positive effect on children delivered with cesarean section. A recent study investigated if immediate SSC after cesarean birth had an effect of the transfer rate of newborns to the neonatal intensive care unit (NICU) for observation [6]. A significant reduction was found, reducing the number form 5.6% to 1.75%. These new care routines are not only important for the patient’s wellbeing but also for improving health economics.
To date SSC is hardly ever implemented for newborns who are clinically unstable due to prematurity or other illness. Such infants are routinely separated from the parents in incubators, warm beds or “hot rooms”, often for long periods of time. Modern neuroscience recognizes that early development of the brain is dependent on sensory experience of positive maternal stimulations, even at early fetal stages [7], and this adaptation is likely mediated through epigenetic changes. Preterm birth and low birth weight are known to be associated with an increased risk of psychiatric disorders, most commonly mood and anxiety disturbances [8,9]. Swedish reports, using national registers, verified that individuals being born with a very low birth weight or prematurely are more likely to be hospitalized with a diagnosis of psychiatric disorders, i.e. psychosis, bipolar affective disorder, depression and eating disorder [10,11]. In other words, this particular risk group may be in extra need of SSC to avoid the stress exposure of separation. However, there are a few small studies showing SSC suitability for unstable infants [12,13], but more data is needed to make SSC praxis. A large randomized control trial, organized by WHO, is about to launch to investigate SSC vs. separation of unstable premature/low birth weight infants, with mortality as primary outcome.

There are no mechanistic data of the positive effects of SSC, but it may improve stabilization by supporting intrinsic maternal-neonate regulation that promotes neonatal physiological functions and attenuating potentially harmful autonomic-neuro endocrine stress responses. Lowered and harmonized cortisol levels have been measured at mildly stressful situations -e.g. at bath or still-face test - in SSC treated babies compared to conventional care [14]. Further, a long term study conducted by Feldman et al. [15] showed remarkably results; SSC increased autonomic functioning of the infant in addition to maternal attachment behavior in the postpartum period. Additionally, a reduced maternal anxiety and an enhanced child cognitive development and executive functions were detected in measures from 6 months to 10 years. By age 10, children who received SSC showed an improved stress-resilience and better cognitive control.

The benefits of immediate SSC (iSSC) is well documented but there is a need for a large well-controlled trial to test the effect of iSSC in unstable preterm/SGA (small for gestational age) neonates on neonatal physiological function, and further to investigate the mechanisms mediating its effects on developmental disability and long-term neuro developmental outcome. Such studies can identify early risk factors that are modifiable, laying the grounds for preventive strategies for improved public health.

**References**

1. Godfrey KM, Lillycrop KA, Burdge GC, Gluckman PD, Hanson MA (2013) Non-imprinted epigenetics in fetal and postnatal development and growth. Nestle Nutr Inst Workshop Ser 71: 57-63.
2. (2005) Roberton’s textbook of neonatology. Elsevier Churchill Livingstone, UK.
3. Bergman NJ, Jurisio LA (1994) The ‘kangaroo-method’ for treating low birth weight babies in a developing country. Trop Doct 24(2): 57-60.
4. Bergman NJ, Linley LL, Fawcus SR (2004) Randomized controlled trial of skin-to-skin contact from birth versus conventional incubator for physiological stabilization in 1200- to 2199-gram newborns. Acta Paediatr 93(6): 779-785.
5. Conde-Agudelo A, Belzán JM, Díaz-Rossello J (2011) Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Syst Rev 4: CD002771.
6. Schneider LW, Crenshaw JT, Gilder RE (2017) Influence of Immediate Skin-to-Skin Contact During Cesarean Surgery on Rate of Transfer of Newborns to NICU for Observation. Nurs Womens Health 21(1): 28-33.
7. Schore AN (2001) Effects of a secure attachment relationship on right brain development, affect regulation, and infant mental health. Infant Mental Health Journal 22(1-2): 7-66.
8. Elgen I, Sommerfelt K, Markestad T (2002) Population based, controlled study of behavioural problems and psychiatric disorders in low birthweight children at 11 years of age. Arch Dis Child Fetal Neonatal Ed 87(2): F128-F132.
9. Patton GC, Coffey C, Carlin JB, Olsson CA, Morley R (2004) Prematurity at birth and adolescent depressive disorder. Br J Psychiatry 184: 446-447.
10. Lindstrom K, Lindblad F, Hjern A (2009) Psychiatric morbidity in adolescents and young adults born preterm: a Swedish national cohort study. Pediatrics 123(1): e47-e53.
11. Nosarti C, Gourrouchou E, Healy E, Rifkin L, Wahbe M, et al. (2008) Grey and white matter distribution in very preterm adolescents mediates neurodevelopmental outcome. Brain 131(PT 1): 205-217.
12. Pervin J, Gustafsson FE, Moran AG, Roy S, Persson LA, et al. (2015) Implementing Kangaroo mother care in a resource-limited setting in rural Bangladesh. Acta Paediatr 104(5): 458-465.
13. Carbasea A, Kracher S, Hauser M, Langlet C, Escande B, et al. (2013) Safety and effectiveness of skin-to-skin contact in the NICU to support neurodevelopment in vulnerable preterm infants. J Perinat Neonatal Nurs 27(3): 255-262.
14. Morellus E, Ortenstrand A, Theodorsson E, Frostell A (2015) A randomised trial of continuous skin-to-skin contact after preterm birth and the effects on salivary cortisol, parental stress, depression, and breastfeeding. Early Hum Dev 91(1): 63-70.
15. Feldman R, Rosenthal Z, Edelman A (2014) Maternal-preterm skin-to-skin contact enhances child physiologic organization and cognitive control across the first 10 years of life. Biol Psychiatry 75(1): 56-64.
