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

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Introduction

Immediately at birth, the preterm infant needs support through the transition from the intrauterine environment to the very different extraterrestrial 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 endocrine regulation that promotes neonatal physiological functions and attenuating potentially harmful autonomic-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 control across the first 10 years of life. Biol Psychiatry 75(1): 56-64. Feldman R, Rosenthal Z, Eidelman AI (2014) Maternal-preterm skin-to-skin contact enhances child physiologic organization and cognitive development and executive functions were detected in measures at 6 months to 10 years. By age 10, children who received SSC showed an improved stress-resilience and better cognitive control. Scand J Clin Lab Invest Suppl 219: 57-60. Bergman NJ, Linley LL, Fawcuss 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.

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 gestation aTage) 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