

After adjusting for confounding variables such as gestational age at birth, being SGA, and severity of illness, being born in Period 1 remained associated with a lower change in weight Z-Score from birth to discharge (B-coefficient 0.283 IC 95% 0.318-0.866; $p < 0.0001$)

Relevance to NIDCAP

Moving to single rooms resulted in better environmental profile scores. Also, the weight gain of the babies was higher in the new NICU. We hypothesize that this could be because the environment was better than previously, and favored families' privacy.

Conclusion

Preterm infants were found to have better growth during admission after the architectural change, despite a higher prevalence of SGA infants and a lower gestational age in this period. Due to the retrospective design of the study, we cannot rule out that other factors could have influenced our results.

References

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The Skincubator: A Novel Device for Early Prolonged Skin-to-Skin Care for Very and Extreme Preterm Neonates

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DOI 10.14434/do.v17i1.37076

Background

Skin-to-Skin Care (SSC) reduces morbidity and mortality in preterm newborns (PN) and is an important part of developmental care. However, extremely preterm infants are generally ineligible for early, prolonged SSC because of the need for increased humidity, and visibility, which is currently available only in incubators. To address these issues and enable continuous SSC in this population we invented the Skincubator – a novel, wearable, bottomless incubator (Figure 1). The Skincubator creates an enclosed environment with all the advantages of a neonatal incubator (humidity, temperature regulation, and good visibility) on the parent's torso. Enabling early prolonged SSC for very preterm newborns.

Aims

To evaluate the feasibility, safety, and thermal management of SSC in the Skincubator versus traditional SSC.

Methods

A safety trial comparing thermal stability during traditional-SSC (t-SSC) sessions, and Skincubator sessions was conducted. Population: Step 1: five PN, GA 29-34 weeks from Day of Life (DOL) four with no respiratory support. Step 2: five PN, 26-33 weeks from DOL 4. Step 3: fifteen PN, GA 26-33 weeks from birth or 24-28 from DOL 4. Temperature stability, humidity levels, and parental feedback were assessed during both types of SSC sessions.

Results

Eighteen preterm newborns were enrolled in steps 1-3. In steps 2-3 we compared 35 paired sessions of Skincubator and t-SSC performed on 12 babies. (One baby– treated in the Skincu-

Figure 1

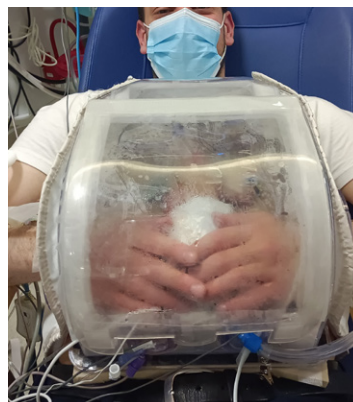


Figure 1. A 660-gram preterm baby in the Skincubator, in skin-to-skin contact with his father, with 85% environmental humidity.

Figure 2



Figure 2. The updated model of the Skincubator that we are developing following learning and feedback from the parents and staff who participated in the trial. It includes: an opening for parents to see, smell, and talk with the infant; easy access for staff from multiple points; and allows most nursing and clinical procedures while in SSC. It has disposable covering to reduce contamination risk, dedicated anchors for all lines and tubes, and safe anchoring of the baby on the caregiver's chest.

bator in delivery room, was excluded from session analysis because parents did not participate in the study in the NICU). Demographics of included PN were (average (range)): GA 29 (26-32); weight 1288 gram (660-1590) DOL 5.2 (1-11).

No safety issues occurred during Skincubator care. Skincubator humidity was $>70\%$, 95% of the time. Parents appreciated the Skincubator as safe and comfortable. The average time out

of the axillary temperature target (36.5° - 37.5°) was 7.4±13.5 and 19.7±27.8 min during Skincubator and T-SSC respectively (p=0.002). Initial temperature drop during Skincubator care was smaller than in t-SSC (0.2°±0.1 vs 0.5°±0.3 P<0.001 n=35).

Six babies had PICC lines or umbilical venous catheters, and one received phototherapy during Skincubator care. No line dislodgment occurred. No baby had moderate hypothermia during Skincubator care. Five babies experienced moderate hypothermia of 35.5-35.9 during 6 t-SSC sessions.

Relevance to NIDCAP

The Skincubator may promote early SSC for very and extreme

preterm newborns, aligning with the principles of NIDCAP by providing individualized, developmentally supportive care in the NICU.

Conclusions

The Skincubator can effectively create a humidified and warm environment on the human body for PN. The Skincubator seems to be safe and may be superior to t-SSC in maintaining PN temperature, this may be clinically significant for extreme PN. Further research is needed to validate these promising results and assess the long-term benefits of the Skincubator in improving outcomes for premature neonates.

Historical Roots of Developmental Care in Newborn Infants: A Bibliometric Analysis Using Reference Publication Year Spectroscopy

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DOI 10.14434/do.v17i1.37077

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Currently, some kind of developmental care is to be found in most Neonatal Intensive care Units (NICU), and the presence and participation of the parents are considered fundamental by neonatologists worldwide. The history of developmental care has rarely been studied. Bibliometrics as a quantitative method is not only useful for research assessment purposes, but also for analyzing the history of science. Reference Publication Year Spectroscopy (RPYS) was proposed to objectively analyze the roots of a research field.¹ RPYS has been used for example for neonatal pain.²

Aim

We investigated the historical origins of developmental care in newborn infants using RPYS to reveal the most important publications for the evolution of this research field and to evaluate their relative importance within the field.

Methods

A Web of Science search query combining infant- and intervention-related synonyms was performed on February 2, 2022. The search retrieved 5,633 papers containing 7,248 distinct cited references. RPYS analysis was performed on this dataset to identify the most referenced historical publications for developmental care in newborn infants. Median deviation analysis identified peak publication years including the most cited historical references. Landmark papers were defined as those belonging to the top 10% of the most frequently referenced publications for longer than 20 years.

Results

The RPYS peaks showed an early phase (1936-1986), during which infant development was studied and analyzed, leading to a conceptualization of developmental care for newborn infants. The following years (1986-2015) showed an explosion of interest in developmental care, highlighting two main programs: the Newborn Individualized Developmental Care and Assessment Program (NIDCAP) and the Infant Health and Development Program (IHDP) with many publications during those years striving to demonstrate the evidence of their clinical benefits.

Relevance to NIDCAP

A major turning point was the conceptualization of the Synactive Theory of Development by H. Als in 1982. NIDCAP (and the IHDP) provided the basis of the broad concept of infant and family-centered developmental care, implemented at various levels in most NICUs since the turn of the century.

Conclusion

Developmental care has become increasingly important through the implementation of two programs: NIDCAP and IHDP.

Published 2024, Acta Paediatrica <https://doi.org/10.1111/apa.16996>

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