

Sigma's VIRTUAL 31st International Nursing Research Congress (Wednesday, 22 July - Friday, 24 July)

Application of Heated Disposable Blanket in Preventing Neonatal Hypothermia During Transportation

Wing Yi Kaness Ching, MSN¹

Kam Tak Camille Ho, MSN²

Shun Kiu Margaret Cheung, BHS¹

Hoi Yi Wong, MSN¹

(1)Department of Obstetrics and Gynaecology, St. Paul's Hospital, Hong Kong, Hong Kong

(2)Nursing Administration Department, St. Paul's Hospital, Hong Kong, Hong Kong

Purpose:

Neonatal hypothermia is prevalent and is associated with neonatal morbidity and mortality, especially in newborns suffering from prematurity, severe infection and asphyxia (Lunze et al., 2013). Despite full compliance with routine interventions, it proved difficult to keep newborns warm (Lapcharoensap & Lee, 2016; McCall et al., 2018). A drop in temperature was noted between the time of birth and admission to nursery, and the risk increased with longer duration of transport (Gleason & Juul, 2018). Instant heated disposable (IHD) blankets are typically used in adult patients undergoing hypothermia or cardiac interventional procedures. A project intended to prevent hypothermia in newborns through IHD blanket was carried out in Department of Obstetrics and Gynaecology of St. Paul's Hospital.

Methods:

A total of 672 newborns and 665 mothers were included from 6 March to 31 August 2019. All newborns received warming through IHD blanket during transport from delivery or operating room to nursery. Before delivery, outer package was unsealed to allow heat activation. After delivery, newborn was thoroughly dried and wrapped in warm towels by midwife. The pre-heated IHD blanket was then applied as soon as the newborn was nursed in incubator before transport. Upon admission to nursery, temperature was taken rectally using digital thermometer. On the second day of delivery, maternal satisfaction level was surveyed.

Results:

Regarding the primary outcome, mean temperature using routine interventions and IHD blanket was 36.1°C and 36.5°C respectively. Incidence of moderate to severe neonatal hypothermia decreased from 15% to 10%. Warming was well tolerated with no cases of hyperthermia or dermal irritation. Regarding the secondary outcome, most (76%) mothers rated their satisfaction at high levels. Effective warming helped weaning newborns from incubator to open cot and promoted maternal bonding.

Conclusion:

By generating a predictable amount of heat instantly and maintaining warmth over a prolonged period of time, IHD blanket aids prevention of neonatal hypothermia in a reliable manner. It is preferred to other comparable devices for several reasons. First, it is a fully mobile warming device which allows healthcare providers to move the newborn without any hassle. Second, it is disposable after use and does not disrupt infection

control practices. Third, it does not rely on an electrical source. Fourth, it has a long shelf life and compact packaging design. The operating and maintenance costs are minimal. It could potentially be an innovative and cost-effective thermal solution not only in hospitals but also out of hospitals such as during inter-hospital transfer for critically ill newborns. It would also be beneficial to explore product with longer heat duration for premature newborns who have difficulty in reserving heat during incubator care, maternal bonding or breastfeeding (Hsu et al., 2015; Valizadeh et al., 2017). However, there were several limitations worth mentioning. First, some staff found access to newborns through the incubator armholes more difficult with IHD blanket. Second, environmental concern was raised due to its non-reusable nature. The project has to be reviewed accordingly to facilitate future implementation and responsible disposition of product.

Title:

Application of Heated Disposable Blanket in Preventing Neonatal Hypothermia During Transportation

Keywords:

Body temperature, Heated blanket and Neonatal hypothermia

Abstract Summary:

A project intended to prevent neonatal hypothermia through instant heated disposable (IHD) blanket was carried out in St. Paul's Hospital. IHD blankets could potentially be an innovative and cost-effective thermal solution not only in hospitals but also out of hospitals such as during inter-hospital transfer for critically ill newborns.

References:

- Gleason, C.A., & Juul, S.E. (2018). *Avery's Diseases of the Newborn* 10th ed. USA: Elsevier
- Hsu, K.H., Chiang, M.C., Lin, S.W., Lin, J.J., Wang, Y.C., & Lien, R. (2015). Thermal Blanket to Improve Thermoregulation in Preterm Infants: A Randomized Controlled Trial. *Pediatric Critical Care*, 16(7), 637-643
- Valizadeh, L., Mahallei, M., Safaiyan, A., Ghorbani, F., & Peyghami, M. (2017). Comparison of the Effect of Plastic Cover and Blanket on Body Temperature of Preterm Infants Hospitalized in NICU: Randomized Clinical Trial. *Journal of Caring Sciences*, 6(2), 163–172
- Lapcharoensap, W., & Lee, H. (2016). Temperature Management in the Delivery Room and During Neonatal Resuscitation. *NeoReviews*, 17(8), 454-462
- Lunze, K., Bloom, D.E., Jamison, D.T., & Hamer, D.H. (2013). The Global Burden of Neonatal Hypothermia: Systematic Review of a Major Challenge for Newborn Survival. *BMC Medicine*, 11(1), 1-11
- McCall, E.M., Alderdice, F., Halliday, H.L., Vohra, S., & Johnston, L. (2018). Interventions to Prevent Hypothermia at Birth in Preterm and/or Low Birthweight Infants (Review). *Cochrane Database of Systematic Reviews*, 2018(2), 1-311

First Primary Presenting Author

Primary Presenting Author

Wing Yi Kaness Ching, MSN
St. Paul's Hospital
Department of Obstetrics and Gynaecology
Registered Nurse and Registered Midwife
Hong Kong

Author Summary: Kaness is one of Hong Kong's registered midwives in St. Paul's Hospital. She has coached mothers and families to provide newborn care inside and outside hospital setting for almost ten years. Today, she is going to share her project in preventing neonatal hypothermia, giving us practical ideas we can put to work.

Second Author

Kam Tak Camille Ho, MSN
St. Paul's Hospital
Nursing Administration Department
Senior Nursing Officer
Hong Kong

Author Summary: Camille is one of the Senior Nursing Officers in St. Paul's Hospital. She has been overlooking nine departments and sitting as a member in 10 committees over the past years.

Third Author

Shun Kiu Margaret Cheung, BHS
St. Paul's Hospital
Department of Obstetrics and Gynaecology
Nursing Officer
Hong Kong

Author Summary: Margaret is one of the Lactation Consultants and Nursing Officers in St. Paul's Hospital. She has been attending hospital strategic meetings and improvising operational performances over the past years.

Fourth Author

Hoi Yi Wong, MSN
St. Paul's Hospital
Department of Obstetrics and Gynaecology
Nursing Officer
Hong Kong

Author Summary: Hoi Yi is one of the Lactation Consultant and Nursing Officer in St. Paul's Hospital. She has been attending hospital strategic meetings and improvising operational performances over the past five years.