

Cooling With Phase-Change-Material in Vietnam: Outcomes at 18 Months

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Abstract : Background: Hypoxic Ischemic Encephalopathy is one of the major causes of neonatal death and those who survive with severe encephalopathy are more likely to develop adverse long-term outcomes such as neurocognitive impairment and cerebral palsy, which is a huge burden, especially in low-middle income countries. It is important to have a long-term follow-up for early detection and promote early intervention for these groups of high-risk infants. Aim: To determine the neurological outcome of cooling infants at 18 months and identify an optimized neurological examination scale for Hypoxic Ischemic Encephalopathy infants in Vietnam. Method: Descriptive study of neurodevelopmental outcomes at 18 months of HIE infants who underwent therapeutic hypothermia treatment in Vietnam. All survived cooling infants were assessed at discharge and at 6, 12, and 18 months by a pediatric physical therapist and a neurologist using two assessment tools: Ages and Stages Questionnaires and the Hammersmith Infant Neurological Examination scale to detect impairments and promote early intervention for those who require it. Results: During a 3-year period, a total of 130 neonates with moderate to severe HIE underwent therapeutic hypothermia treatment using Phase change material mattress (65% moderate, 35% severe – Sarnat). 43 (33%) died during hospitalization and infancy; among survivors, 69 (79%) completed 3 follow-ups at 18 months. At 18 months, 25 had cerebral palsy, 11 had mild delayed neurodevelopment. At each time-point, infants with a normal/mildly delayed neurodevelopment had significantly higher Ages and Stages Questionnaires and Hammersmith Infant Neurological Examination scores ($p < 0.05$) than those with cerebral palsy. Conclusion: The study showed that the Ages and Stages Questionnaires and Hammersmith Infant Neurological Examination is a helpful tool in the process of early diagnosis of infants at low and high neurological risk and identifying those infants needing specific rehabilitation programme.

Keywords : encephalopathy, phase-change-material, neurodevelopment, cerebral palsy

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