IAP - IJPP CME - 2024

POST ASPHYXIAL MANAGEMENT IN LEVEL I AND II NEONATAL INTENSIVE CARE UNITS

*Prakash V **Elayarani Elavarasan

Abstract: Perinatal asphyxia remains a major challenge in developing countries, contributing significantly to neonatal morbidity and mortality. Level I and level II neonatal care units often serve as the first point of contact for affected newborns. It is essential that these units are equipped appropriately with gadgets and personnel to promptly recognize the signs of hypoxic ischemic encephalopathy, stabilize affected neonates and facilitate timely referral to higher centers when necessary. This article focuses on the clinical presentation of neonatal encephalopathy, interventions available and the immediate management protocols for hypoxic-ischemic injury.

Keywords: Perinatal asphyxia, Therapeutic hypothermia, Neonatal seizures.

- * Head and Clinical Lead, Department of Neonatology and Pediatrics
- ** Associate Consultant,
 Pediatrics,
 Prashanth Superspeciality Hospital, Kolathur.
 email: dr praky76@yahoo.com

Points to Remember

- Cord arterial blood gas or any blood gas should be undertaken within one hour of birth in cases of suspected perinatal asphyxia to enable early identification of babies with hypoxic ischemic encephalopathy.
- Neonatal units providing only Level I or II care should avoid using uncontrolled or unmonitored cooling methods, as therapeutic hypothermia requires specialized equipment and trained personnel available in tertiary centers.
- Early referral within 4 hours of birth to a tertiary care centre with facilities for therapeutic hypothermia is advised if baby has moderate or severe asphyxia, ensuring initiation of cooling therapy within the critical 6-hour window.
- In neonates with mild encephalopathy or with suspected perinatal asphyxia, periodic assessment using modified Sarnat and Sarnat staging should be done to monitor progression to moderate encephalopathy.

References

- 1. World Health Organization. Perinatal mortality: A listing of available information. Geneva: World Health Organization; 1996.
- 2. National Neonatal Perinatal database NNPD 2002-2023. Indian council of Medical Research, New Delhi. 2005
- Perin J, Mulick A, Yeung D, Villavicencio F, Lopez G, Strong KL, et al. Global, regional, and national causes of under-5 mortality in 2000-19: an updated systematic analysis with implications for the Sustainable Development Goals. Lancet Child Adolesc Health. 2022; 6(2):106-115.
- 4. Krishnan V, Kumar V, Variane GFT, Carlo WA, Bhutta ZA, Sizonenko S, et al. Newborn Brain Society Guidelines and Publications Committee. Need for more evidence in the prevention and management of perinatal asphyxia and neonatal encephalopathy in low and middleincome countries: A call for action. Semin Fetal Neonatal Med. 2021; 26(5):101271.

Cite as: Prakash V, Elayarani Elavarasan, Post asphyxial management in level I and II neonatal intensive care units, Indian J Pract Pediatr. 2025; 27(2):112-121.

- Ellis M, Manandhar N, Shrestha PS, Shrestha L, Manandhar DS, Costello AM. Outcome at 1 year of neonatal encephalopathy in Kathmandu, Nepal. Dev Med Child Neurol. 1999; 41(10):689-95.
- 6. Armour EA, Curcio AM, Fryer RH. Neonatal Hypoxic Ischemic Encephalopathy: An Updated Preclinical and Clinical Review. OBM Neurobiol. 2020; 4(3):1-5.
- 7. Thayyil S, Oliveira V, Lally PJ, Swamy R, Bassett P, Chandrasekaran M, et al. HELIX Trial group. Hypothermia for encephalopathy in low and middle-income countries (HELIX): study protocol for a randomised controlled trial. Trials. 2017; 18(1):432.
- 8. Schendel D. Executive summary: neonatal encephalopathy and neurologic outcome, Report of the American College of Obstetricians and Gynecologists' task force on neonatal encephalopathy. ObstetGynecol. 2014; 123(4):896-901.
- 9. Davidson JO, Dean JM, Fraser M, Wassink G, Andelius TC, Dhillon SK, et al. Perinatal brain injury: mechanisms and therapeutic approaches. Front Biosci (Landmark Ed). 2018; 23(12):2204-26.
- Shankaran S, Laptook AR, Ehrenkranz RA, Tyson JE, McDonald SA, Donovan EF, et al. National Institute of Child Health and Human Development Neonatal Research Network. Whole-body hypothermia for neonates with hypoxic-ischemic encephalopathy. N Engl J Med. 2005; 353(15):1574-84.
- 11. Laptook A, Tyson J, Shankaran S, McDonald S, Ehrenkranz R, Fanaroff A, et al. National Institute of Child Health and Human Development Neonatal Research Network. Elevated temperature after hypoxicischemic encephalopathy: risk factor for adverse outcomes. Pediatrics. 2008; 122(3):491-9.
- 12. Welsford M, Nishiyama C, Shortt C, Isayama T, Dawson JA, Weiner G, et al. International Liaison Committee on Resuscitation Neonatal Life Support Task

- Force. Room air for Initiating term newborn Resuscitation: A Systematic Review with Meta-analysis. Pediatrics. 2019; 143(1):e20181825.
- 13. Chiruvolu A, Wiswell TE. Appropriate Management of the Nonvigorous Meconium-Stained Newborn Meconium. Neoreviews. 2022; 23(4):e250-e261.
- Malin GL, Morris RK, Khan KS. Strength of association between umbilical cord pH and perinatal and longterm outcomes: systematic review and meta-analysis. BMJ. 2010; 340:c1471.
- Singh Y, Katheria AC, Vora F. Advances in Diagnosis and Management of Hemodynamic Instability in Neonatal Shock. Front Pediatr. 2018; 6:2. doi: 10.3389/ fped.2018.00002. PMID: 29404312; PMCID: PMC5780410.
- Tanigasalam V, Plakkal N, Vishnu Bhat B, Chinnakali P. Does fluid restriction improve outcomes in infants with hypoxic ischemic encephalopathy? A pilot randomized controlled trial. J Perinatol. 2018; 38(11):1512-17.
- 17. Pressler RM, Abend NS, Auvin S, Boylan G, Brigo F, Cilio MR et al. Treatment of seizures in the neonate: Guidelines and consensus-based recommendations-Special report from the ILAE Task Force on Neonatal Seizures. Epilepsia. 2023; 64(10):2550-70.
- 18. Young L, Berg M, Soll R. Prophylactic barbiturate use for the prevention of morbidity and mortality following perinatal asphyxia. Cochrane Database Syst Rev. 2016; 2016(5):CD001240.
- Glass HC, Wood TR, Comstock BA, Numis AL, Bonifacio SL, Cornet MC, et al. Predictors of Death or Severe Impairment in Neonates With Hypoxic-Ischemic Encephalopathy. JAMA Netw Open. 2024; 7(12): e2449188.