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Can therapeutic hypothermia in infants with mild neonatal hypoxic ischaemic encephalopathy be an effective treatment technique in preventing adverse neurodevelopmental outcomes? A systematic review

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Abstract

Background: Hypoxic Ischaemic Encephalopathy (HIE) is one of the leading causes of neonatal deaths and often results in suboptimal neurocognitive development in the affected children. The use of therapeutic hypothermia (TH) to treat or reduce the severity of the effects in moderate and severe cases has been researched and carried out as part of national guidelines for years. However, a recent therapeutic creep of the use of TH in mild HIE has shined a light on the knowledge gap of this treatment and initiated several trials worldwide to observe its effects in those with milder cases.

Methods: Initially, a PICO format was used to provide the basis of the research being conducted, as well as specific criteria to look for in the search for appropriate literature. PubMed, Medline, Embase and OVID were used to conduct a thorough literature search for systematic reviews comparing the outcomes of infants with mild HIE that underwent cooling treatment vs supportive management. The papers found were then filtered through a set of inclusion and exclusion criteria. The remaining 4 studies were quality appraised using the CASP tool. Subsequently, data extraction followed, including an analysis of the results of each chosen study, in order to reach an unbiased conclusion of the available literature.

Results: Some studies have suggested TH is an effective treatment that should be part of official treatment guidelines, exploring the neuroprotective effects of TH. Furthermore, some studies even state cooling in mild HIE has the potential to reverse damage, to get patients onto the same cognitive basis as their healthy peers. Others err on the side of caution, with concern over its safety and negative effects on the patients receiving it, including prolonged hospital stays, delayed enteral feeding, parent-child separation and largely increased resource utilisation, as well as expenses.

Conclusions: Despite the potential for better treatment options and both short- and long-term outcomes for children born with mild HIE, due to the unclear results of the reviewed

studies, it cannot be stated for certain whether using TH in mild HIE is an appropriate and safe management method. Therefore, it is essential for further large-scale trials to take place to establish the efficacy and safety of this treatment in mild HIE.

Keywords: Mild hypoxic Ischaemic Encephalopathy | Therapeutic Hypothermia| Neurodevelopmental Outcomes | Cooling

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