Maria Björklund, Librarian / Information specialist
Library & ICT, Faculty of Medicine
Lund University
maria.bjorklund@med.lu.se

Interventions for the management of pain and sedation in newborns undergoing therapeutic hypothermia for hypoxic-ischemic encephalopathy - a systematic review

Supplementary material

Appendix 1 "search report"

SEARCH REPORT

PROJECT INFORMATION

REQUEST DATE	NAME	INSTITUTION/ORGANISATION
20210120	Matteo Bruschettini	Cochrane Sweden
	Emma Olsson	Department of Pediatrics, Faculty of Medicine and Health, Örebro University, Örebro, Sweden
	Pyrola Bäcke Ylva Thernström Blomqvist	University Hospital, Neonatal Intensive Care Unit, Uppsala, Sweden Department of Women's and Children's Health, Uppsala University, Uppsala, Sweden

PROJECT TIME FRAME – DESIRED DATE OF DELIVERY

January 2021

DESCRIBE RESEARCH QUESTION AND PURPOSE WITH THE SEARCH

The aim of the study is to perform a systematic review of pharmacological and non-pharmacological interventions for the management of pain and sedation in newborn infants undergoing therapeutic hypothermia for hypoxic-ischemic encephalopathy.

The review will be a Cochrane Review

SEARCH TERMS

PROVIDE SEARCH TERMS ACCORDING TO PICO(S), PEO OR IN FREE ORDER

Patient / population / problem	Infants/neonates undergoing therapeutic hypothermia for hypoxic-ischemic encephalopathy
Intervention	Drug therapy, any dose, route, administration of

	Morphine Fentanyl benzodiazepines Midazolam Alpha-2 agonists Clonidine Paracetamol
	Non-pharmacological interventions: swaddling, sweet solutions, facilitated tucking and non-nutritive sucking
Comparison / control	See protocol

Outcome
Primary outcomes

1. Analgesia and sedation assessed with validated pain scales (the Neonatal Facial Coding system (NFCS) (Grunau 1987), the Neonatal Infant Pain scale (NIPS) (Lawrence 1993), the Premature Infant Pain Profile (PIPP and PIPP-r) (Stevens 1996, Stevens 2014), the Neonatal Pain, Agitation and Sedation scale (N-PASS) (Hummel 2008), the CRIES (acronym for Crying, Requires oxygen, Increased vital signs, Expressioni, Sleepless) scale (Krechel 1995), the Echelle Douleur Inconfort Nouveau-ne (EDIN) scale (Debillon 2001), the COMFORTneo (van Dijk 2009) and the Astrid Lindgren and Lund Children´s Hospital´s Pain and Stress Assessment scale for Preterm and Sick Newborn Infants (ALPS-neo) (Lundqvist 2014). Pain and sedation scores will be assessed during the 72 hours of the hypothermia procedure.

2. Circulatory instability, defined as hypotension requiring medical therapy (vasopressors, fluid boluses, or any changes in such drug administration).

3. Mortality to discharge.

4. Moderate-to-severe neurodevelopmental disability: cerebral palsy, developmental delay (Bayley Scales of Infant Development – Mental Development Index Edition II (BSID-MDIII; Bayley 1993; Bayley Scales of Infant and Toddler Development – Edition III Cognitive Scale (BSITD-III) (Bayley 2006); or Griffiths Mental Development Scale – General Cognitive Index (GCI) (GriPiths 1954; GriPiths 1970) assessment greater than two standard deviations (SDs) below the mean); intellectual impairment (intelligence quotient (IQ) greater than two SDs below the mean); blindness (vision less than 6/60 in both eyes) or sensorineural deafness requiring amplification (Jacobs 2013). We will separately assess data on children aged 18 to 24 months and aged three to five years.

Secondary outcomes

1. Neonatal mortality (death within 28 days of birth)

2. Duration of hospital stay

3. Days to reach full enteral feeding

4. Analgesia assessed with neurophysiological measures such as NIRS (near infrared spectroscopy) or GSR (galvanic skin response)

5. Focal gastrointestinal perforation

6. Episodes of bradycardia, defined as a fall in heart rate greater than 30% below baseline or less than 80 beats per minute for 10 seconds or longer, during exposure to the intervention

7. We plan to evaluate each of the components of "Moderate-to-severe neurodevelopmental disability" as a separate outcome and extract data on each long-term outcome from studies that evaluated children after 18 months' chronological age, assessing data on children 18 to 24 months of age and on those 3 to 5 years of age separately.

Studytypes	Randomized studies

REFERENCES TO KEY ARTICLES – EXAMPLES OF YOU WANT TO HAVE INCLUDED IN THE SEARCH RESULT (3-5 ARTICLES)

DESIRED DELIVERY FORMAT (ENDNOTE, WORD, PDF)

EndNote library

Search strategy for protocol created 2021-01-20.

No publication dates or language restrictions will be used.

PubMed

(((((infant, newborn[MeSH] OR newborn*[TIAB] OR "new born"[TIAB] OR "new borns"[TIAB] OR "newly born"[TIAB] OR baby*[TIAB] OR babies*[TIAB] OR premature[TIAB] OR prematurity[TIAB] OR preterm[TIAB] OR "pre term"[TIAB] OR "low birth weight"[TIAB] OR "low birthweight"[TIAB] OR LBW[TIAB] OR infan*[TIAB] OR neonat*[TIAB]) NOT (animals [mh] NOT humans [mh]))))

AND ((hypoxic-ischemic[Title/Abstract]) OR (encephalopathies, hypoxic ischemic[MeSH Terms]) OR (encephalopath*[Title/Abstract]) OR (asphyxia[MeSH Terms]) OR (asphyxi*[Title/Abstract])))

AND ((hypothermia, induced[MeSH Terms]) OR (hypothermia[Title/Abstract]) OR (induced hypothermia[Title/Abstract]) OR (therapeutic hypothermia[Title/Abstract]) OR (cooling[Title/Abstract]) OR (temperature management[Title/Abstract]))

AND
((randomized controlled trial[Publication Type]) OR (controlled clinical trial[Publication Type])) OR ((((randomized[Title/Abstract] OR randomly[Title/Abstract] OR randomised[Title/Abstract]) OR (placebo[Title/Abstract] OR drug therapy[Title/Abstract])) OR (groups[Title/Abstract] OR trial[Title/Abstract])) OR (((single[Title/Abstract] OR doubl*[Title/Abstract] OR tripl*[Title/Abstract] OR treb*) AND (blind*[Title/Abstract] OR mask*))))

CINAHLComplete (Ebsco)

(infant or infants or infantile or infancy or newborn* or "new born" or "new borns" or "newly born" or neonat* or baby* or babies or premature or prematures or prematurity or preterm or preterms or "pre term" or premies or "low birth weight" or "low birthweight" or LBW)
AND
MH Hypoxia-Ischemia, Brain, Neonatal OR (hypoxic-ischemic OR encephalopath* OR asphyxi*)
AND

MH Hypothermia, Induced OR (hypothermia OR induced hypothermia OR therapeutic hypothermia OR temperature management OR cooling)

AND
PT randomized controlled trial OR PT controlled clinical trial OR (randomized OR randomly OR randomised OR placebo OR drug therapy OR groups OR trial OR) OR (single OR doubl* OR tripl* OR treb*) AND (blind* OR mask*))

Cochrane CENTRAL

MESH DESCRIPTOR Infant, Newborn EXPLODE ALL AND CENTRAL:TARGET
OR infant or infants or infant's or "infant s" or infantile or infancy or newborn* or "new born" or "new borns" or "newly born" or neonat* or baby* or babies or premature or prematures or prematurity or preterm or preterms

or "pre term" or premies or "low birth weight" or "low birthweight" or VLBW or LBW or ELBW or NICU AND CENTRAL:TARGET

AND
(MeSH descriptor: [Hypoxia-Ischemia, Brain] explode all trees OR MeSH descriptor: [Hypoxia-Ischemia, Brain] explode all trees OR hypoxic-ischemic OR encephalopath* OR asphyxi*)
AND
(MeSH descriptor: [Hypothermia, Induced] explode all trees OR hypothermia OR induced hypothermia OR therapeutic hypothermia OR temperature management OR cooling)

Scopus

((TITLE-ABS-KEY ((infant OR infants OR infantile OR infancy OR newborn* OR "new born" OR "new born" OR "newly born" OR neonat* OR baby* OR babies OR premature OR premature OR prematurity OR preterm OR preterm OR "pre term" OR premises)) OR TITLE-ABS-KEY (("low birth weight" OR "low birthweight" OR lbw OR nicu)))) AND ((TITLE-ABS-KEY ((hypoxic-ischemi* OR encephalopath* OR asphyxi*)) AND TITLE-ABS-KEY ((hypothermia OR induced AND hypothermia OR therapeutic AND hypothermia OR temperature AND management OR cooling)))) not TITLE-ABS-KEY (animals AND not AND humans)
AND
TITLE-ABS-KEY (randomized OR randomly OR randomised OR placebo OR drug AND therapy OR groups OR trial OR (single OR doubl* OR tripl* OR treb*) AND (blind* OR mask*))

Web of Science

TOPIC: ((infant OR infants OR infantile OR infancy OR newborn* OR "new born" OR "new born" OR "newly born" OR neonat* OR baby* OR babies OR premature OR premature OR prematurity OR preterm OR preterm OR "pre term" OR premises OR "low birth weight" OR "low birthweight" OR lbw OR nicu)) AND TOPIC: ((hypoxic-ischemi* OR encephalopath* OR asphyxi*)) AND TOPIC: ((hypothermia OR induced AND hypothermia OR therapeutic AND hypothermia OR temperature AND management OR cooling)) NOT TOPIC: ((animals NOT humans)) AND
TOPIC: (TITLE-ABS-KEY (randomized OR randomly OR randomised OR placebo OR drug AND therapy OR groups OR trial OR (single OR doubl* OR tripl* OR treb*) AND (blind* OR mask*)))

Clinicaltrials.gov

Other terms
(Hypoxic* OR ischemi* OR encephalopaht* OR hypothermia OR induced AND hypothermia OR therapeutic AND hypothermia OR temperature AND management OR cooling)
AND
randomized OR randomly OR randomised OR placebo OR drug therapy OR groups OR trial OR ((single OR doubl* OR tripl* OR treb*) AND (blind* OR mask*))

Filter: Child (birth-17 years)