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Neuroprotective effects of hypothermia combined with inhaled xenon following perinatal asphyxia

Submission date
03/07/2009

Recruitment status
No longer recruiting

Registration date
30/07/2009

Overall study status
Completed

Last Edited
17/03/2017

Condition category
Pregnancy and Childbirth

[X] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
This is a study of infants suffering from perinatal asphyxia (lack of oxygen during birth) comparing standard care (cooling of the baby) with standard care and additional xenon gas inhaled through a ventilator. The study examines the feasibility and safety of inhaled xenon gas to see whether treatment with the combination of cooling and xenon gas may reduce brain injury, assessed by a MRI scan of the brain at around 8 days of age.

Who can participate?
Infants from 36 to 43 weeks gestation, following perinatal asphyxia

What does the study involve?
Infants are randomly allocated to one of two groups. One group is treated with intensive care and treatment with hypothermia (cooling) for 72 hours combined with inhaled xenon gas for 24 hours. The other group is treated with intensive care with hypothermia for 72 hours. MRI scans are performed once at between 4 - 10 days of age.

What are the possible benefits and risks of participating?
If the study is successful larger studies can be carried out to confirm whether treatment with xenon improves neurological (brain) function after birth asphyxia.

Where is the study run from?
Imperial College London (UK)

When is the study starting and how long is it expected to run for?
February 2012 to September 2014

Who is funding the study?
Medical Research Council (MRC) (UK)

Who is the main contact?
Dr Denis Azzopardi

Contact information

Type(s)
Scientific

Contact name
Dr Denis Azzopardi

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Additional identifiers

Clinical Trials Information System (CTIS)
2009-014344-11

ClinicalTrials.gov (NCT)
NCT00934700

Protocol serial number
G0701714; prot-001-2009

Study information

Scientific Title
Neuroprotective effects of hypothermia combined with inhaled xenon following perinatal asphyxia: a randomised controlled trial

Acronym
TOBYxe

Study objectives
Following perinatal asphyxia treatment with a combination of hypothermia and inhaled xenon preserves cerebral metabolism and structure.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Not provided at time of registration

Study design
Randomised controlled trial

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Perinatal asphyxia with hypoxic-ischaemic encephalopathy

Interventions
Infants will be allocated to one of two groups: intensive care and treatment with hypothermia for 72 hours combined with inhaled 30% xenon gas for 24 hours or intensive care with hypothermia for 72 hours. Magnetic resonance spectroscopy (MRS) and magnetic resonance imaging (MRI) will be performed once between 4 - 10 days of age.

Intervention Type
Drug

Phase
Not Applicable

Drug/device/biological/vaccine name(s)
Xenon

Primary outcome(s)
Reduction in Lac/Naa ratio on magnetic resonance spectroscopy or preserved fractional anisotropy diffusion weighted magnetic resonance imaging.

Key secondary outcome(s))
Measured prior to hospital discharge:
1. Intracranial haemorrhage
2. Persistent hypotension
3. Pulmonary haemorrhage
4. Pulmonary hypertension
5. Prolonged blood coagulation time
6. Culture proven sepsis
7. Necrotising enterocolitis
8. Cardiac arrhythmia
9. Thrombocytopenia
10. Major venous thrombosis
11. Renal failure treated with dialysis
12. Pneumonia
13. Pulmonary airleak
14. Duration of hospitalisation

Completion date
30/09/2014

Eligibility

Key inclusion criteria
1. Infants 36 to 43 weeks gestation (either sex) with at least one of the following:
1.1. Apgar score of less than 5 at 10 minutes after birth
1.2. Continued need for resuscitation, including endotracheal or mask ventilation, at 10 minutes after birth
1.3. Acidosis defined as pH less than 7.00 and/or base deficit x 16 mmol/L in umbilical cord blood sample or any blood sample within 60 minutes of birth (arterial or venous blood)
2. Moderate to severe encephalopathy consisting of altered state of consciousness (reduced or absent response to stimulation) and hypotonia, and abnormal primitive reflexes (weak or absent suck or Moro response). Clinical severity of hypoxic-ischaemic encephalopathy (HIE) will be assessed by Thompson encephalopathy score, and modified Sarnat score
3. At least 30 minutes duration of amplitude integrated EEG (aEEG) recording that shows moderately abnormal or suppressed background aEEG activity or seizures

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Neonate

Sex
All

Key exclusion criteria
1. If treatment with hypothermia is delayed beyond 6 hours, or infants are expected to be greater than 12 hours of age at the time of randomisation
2. Infants with ventilatory oxygen requirement greater than 70%
3. Attending clinician considers infant not suitable to participate because of other serious congenital abnormalities, or the infant's condition appears terminal

Date of first enrolment
01/02/2012

Date of final enrolment
30/09/2014

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Department of Paediatrics
London
United Kingdom
W12 5HS

Sponsor information

Organisation
Imperial College London (UK)

ROR
https://ror.org/041kmwe10

Funder(s)

Funder type
Research council

Funder Name
Medical Research Council (MRC) (UK) (ref: G0701714)

Alternative Name(s)
Medical Research Council (United Kingdom), UK Medical Research Council, MRC

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/02/2016		Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes
Study website	Study website	11/11/2025	11/11/2025	No	Yes