ISRCTN11031435 https://doi.org/10.1186/ISRCTN11031435

Anaesthesia with dexmedetomidine and fentanyl for surgery in newborn babies

Submission date 01/01/2017	**Recruitment status** No longer recruiting	[X] Prospectively registered
		[_] Protocol
Registration date 10/01/2017	**Overall study status** Completed	[_] Statistical analysis plan
		[_] Results
Last Edited 16/02/2018	**Condition category** Surgery	[_] Individual participant data
		[_] Record updated in last year

Plain English summary of protocol

Background and study aims
Anaesthesia (sedation) and surgery in newborn babies (neonates) is only performed if absolutely necessary, as they have a high risk of developing complications related to their airways, breathing and heart function. In addition, a large number of recent animal studies have raised concerns that the newborn brain is vulnerable to damage caused by common drugs used for anaesthesia. Fortunately, to date there is no evidence that this damage occuring in humans, but studies to discover even subtle changes in the brain are hard to perform in humans. Alpha-2-agonists are a type of anaesthetic drug that are not associated with damage to the brain in animal studies. In fact, they even seem to have a protective effect against the damage associated with other drugs. One of the alpha-2-agonists is called dexmedetomidine. It is used as a sedative in intensive care, both for adults and children. It may also be used for anaesthesia, although there is very limited experience of this in new born babies. The aim of this study is to find out whether a potentially damaging drug called sevoflurane which is commonly used for anaesthesia, can be replaced by dexmedetomidine in anaethesia induced (started) using a drug called fentanyl.

Who can participate?
Newborn babies who are scheduled to undergo major surgery requiring anaesthesia with high dose fentanyl

What does the study involve?
In the first part of the study, four patients receive routine anaesthesia with fentanyl (a potent drug for treatment of pain) and sevoflurane (an anaesthetic drug), with some extra monitoring of heart and brain function. In the second part of the study, another four patients receive anaesthesia with a low dose of dexmedetomidine, replacing sevoflurane. If there are no serious side effects, then a third group of four patients receives anaesthesia with a higher dose of dexmedetomidine, replacing sevoflurane. Participants in all groups are then monitored for side effects and pain levels for 24 hours after surgery.

What are the possible benefits and risks of participating?
There are no direct benefits to those taking part, although their participation will help the research team learn more about the potentially protective effects of dexmedetomidine during

anaesthesia and its' pain relieving effects during the period after surgery. There is a risk of unexpected effects of heart rate and blood pressure, however patients are closely monitored and such effects, should they occur, may easily be treated by the anaesthetic team.

Where is the study run from?
Uppsala University Hospital (Sweden)

When is the study starting and how long is it expected to run for?
March 2016 to March 2018

Who is funding the study?
Uppsala County Council (Sweden)

Who is the main contact?
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Contact information

Type(s)
Scientific

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Additional identifiers

EudraCT/CTIS number
2016-004264-19

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
NEODEX2

Study information

Scientific Title
Anaesthesia with dexmedetomidine and fentanyl for neonatal surgery: A pilot study

Acronym
NEODEX2

Study objectives
The aim of this pilot study is to assess the feasibility of using dexmedetomidine as an alternative to sevoflurane together with high dose fentanyl for neonatal anesthesia.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Uppsala IRB, 05/04/2017, ref: Dnr 2017/012

Study design
Interventional non-randomised pilot study

Primary study design
Observational

Secondary study design

Study setting(s)
Hospital

Study type(s)
Treatment

Participant information sheet
Not available in web format, please use the contact details below to request a patient information sheet (Swedish only)

Health condition(s) or problem(s) studied
Anaesthesia

Interventions
In the first stage of the study, a control group of four patients are subjected to standard anaesthesia monitoring + NIRS and CFM). The anaesthesia is routine anaesthesia based on fentanyl 10 microgram/kg and atracurium 0.5 mg/kg at induction, with repeat doses at the start of surgery and if indicated due to a long procedure, and sevoflurane up to 1%.

In the second stage, four patients receive anaesthesia with a low dose of dexmedetomidine initially replacing sevoflurane. At induction, dexmedetomidine 0.4 microgr/kg bolus, then 0.6 microgr/kg/h maintenance with a possibility to titrate to max 1 micrograms/kg/h. Sevoflurane is given only as a "rescue" medication, if the anaesthesia is judged to be inadequate.

After completion of the second stage, an interim analysis is performed. If there were no serious adverse events (hypotension or bradycardia needing intervention with adrenaline or

hypoglycaemia needing repeated interventions with glucose administration), and at least two anaesthetics could be completed without sevoflurane, the study is continued with the third stage.

In the third stage, four patients receive the same protocol as in stage two but with a higher dexmedetomidine dose of: bolus 0.7 microgr/kg, maintenance 1 microgr/kg/h, with possible titration up to 2 microgr/kg/h.

Incidence of adverse events is monitored for 24 hours after surgery in all participants.

Intervention Type
Drug

Phase
Phase II

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

Primary outcome measure
Rate of completion of anaesthesia without the addition of rescue anaesthetics (propofol or sevoflurane) and with hemodynamic stability is assessed at the end of the surgery when the patient is handed over to the ICU team.

Secondary outcome measures
1. Incidence of adverse events is assessed 24 hours after the end of surgery
2. Postoperative opioid consumption is assessed 24 hours after the end of surgery
3. Postoperative pain is assessed using N-PASS four-hourly until 24 hours after the end of surgery

Overall study start date
02/03/2016

Completion date
31/03/2018

Eligibility

Key inclusion criteria
1. Admitted to neonatal intensive care unit
2. Scheduled for major abdominal or thoracic surgery requiring anaesthesia with high dose fentanyl (30 micrograms/kg)
3. Delayed extubation is planned, permitting the use of high dose fentanyl
4. Gestational age 39-44 weeks
5. Aged up to one month old

Participant type(s)
Patient

Age group
Neonate

Sex
Both

Target number of participants
12

Key exclusion criteria
1. Extubation planned in the operation theatre
2. Haemodynamic instability requiring inotropic support
3. Weight < 2 kg.
4. Gestational age < 37 weeks or > 44 weeks
5. Treatment with alpha-2-agonist within 12 hours before surgery

Date of first enrolment
01/03/2017

Date of final enrolment
28/02/2018

Locations

Countries of recruitment
Sweden

Study participating centre
Uppsala University Hospital
Department of Anaesthesia and Intensive Care
Uppsala
Sweden
751 85

Sponsor information

Organisation
Uppsala County Council

Sponsor details
Anestesi- och intensivvård
Akademiska Sjukhuset
Uppsala
Sweden
751 85

Sponsor type
Government

Website
www.lul.se

ROR
https://ror.org/01dv86r63

Funder(s)

Funder type
Government

Funder Name
Uppsala County Council

Results and Publications

Publication and dissemination plan
The study will be submitted for publication in an open-access, peer-reviewed scientific journal, most likely with a prior abstract presentation at a scientific meeting in 2018.

Intention to publish date
31/12/2018

Individual participant data (IPD) sharing plan
The current data sharing plans for the current study are unknown and will be made available at a later date.

IPD sharing plan summary
Data sharing statement to be made available at a later date