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Sedation with dexmedetomidine for insertion of plastic tubes into veins of infants

Submission date 05/08/2016	**Recruitment status** No longer recruiting	[X] Prospectively registered [_] Protocol [_] Statistical analysis plan [X] Results [_] Individual participant data
Registration date 08/08/2016	**Overall study status** Completed	
Last Edited 19/10/2022	**Condition category** Neonatal Diseases	

Plain English summary of protocol

Background and study aims
Pain experienced on cannulation with a plastic tube (”i.v.”) of a peripheral vein (that is inserting a plastic tube into the vein in order to give drugs) can have both short and long term adverse effects. While older children often receive local anaesthesia or sedation before the procedure, clinicians hesitate to provide anaesthesia, analgesia (pain killing drugs) or sedation to neonates (babies that have been born within the last 28 days) as they are at an increased risk of complications. Furthermore, the last decade has seen a multitude of animal studies reporting evidence of apoptosis (cell death) when neonatal rodents and even primates are exposed to many of the most common anaesthetic agents. In contrast, the so called alpha-2-agonists seem to protect against apoptosis in neonatal rodents. Dexmedetomidine is an alpha-2-agonist mainly used as an i v infusion for sedation in intensive care, but may also be administered as a nasal aerosol (nose spray) or via the buccal route (by spraying the drug into the mouth). In neonates, the buccal route is well established and is theoretically more predictable than the nasal route due to the small volume that may be given. This study is looking at the effect of buccal dexmedetomidine as a sedative for peripheral venous access for neonates. The overall aim of the study is to improve future neonatal care with by studying this method for reducing painful experiences.

Who can participate?
Neonates in intensive care or a high dependency unit born at between 33-44 weeks.

What does the study involve?
Participants are randomly allocated to one of three groups. Those in group 1 are given 2 micrograms/kg of dexmedetomidine by injection into the mouth. Those in group 2 are given 1 microgram/kg of dexmedetomidine by injection into the mouth. Those in group 3 are a placebo (dummy) dexmedetomidine by injection into the mouth. The injection isn all there cases is given 30 minutes before the cannulation procedure. The amount of pain that the baby is thought to be experiencing is recorded for the first hour after the procedure. Heart rate, blood pressure, breath rate and saturation (amount of oxygen in the body) is monitored for the next during 12 hours, to monitor for complications. Up to three blood sampled are also taken to study plasma concentrations of the study drug (that is, measure the amount of drug in the blood).

What are the possible benefits and risks of participating?
If the reports from animal studies of a protective effect against brain damage are valid also for human infants, taking part in this study could be beneficial for some babies, especially if they later will undergo surgery with anesthesia. Today, safe pharmacological methods (drugs) for pain relief are lacking for newborn babies. The dose of dexmedetomidine and the way it is given make severe haemodynamic (blood circulation) or respiratory (breathing) side effects unlikely. The study will be performed during the day in a neonatal intensive care unit with experienced neonatologists and nurses at hand. If clinically significant side effects do occur, they will be treated according to the routines of the unit.

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 December 2017

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

Who is the main contact?
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Clinical Trials Information System (CTIS)
2016-003275-22

Protocol serial number
NEODEX1-1

Study information

Scientific Title
Dexmedetomidine sedation for neonatal peripheral vein cannulation

Study objectives
Dexmedetomidine reduces the degree of pain reaction to peripheral i v cannulation (including PICC)

Ethics approval required
Old ethics approval format

Ethics approval(s)
Uppsala IRB, 14/12/2016, ref: Dnr 2016/397

Study design
Double-blind randomised placebo-controlled trial

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Procedural pain (from i v cannulation) in neonatal intensive care

Interventions
Neonates planned for i v cannulation are randomised (computerised randomisation procedure) to receive two, one or zero micrograms/kg of dexmedetomidine. The study drug will be administered by buccal injection (syringe without cannula). The dose is two, one or zero micrograms/kg of dexmedetomidine in group D2, D1 and D0, respectively. The study drug is given 30 minutes before the start of the procedure. A nurse injects the study drug with the syringe directed towards the mucus membrane of the lower cheek when the infant´s head is turned towards one side. The volume of study drug is 0.2 – 0.5 ml. The nurse records if the injection was successful or if the dose may have been swallowed, expunged through vomiting or other reasons. If vomiting occurs within one minute of injection, a second injection of the planned dose is given.

All three groups receive standard care including nursing in a heated humidified environment if indicated, skin contact and cuddling.

Intervention Type
Drug

Phase
Phase III/IV

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

Primary outcome(s)
Observational pain scale (N-PASS). Assessment will be performed 5 minutes before the start of the procedure, at the time of the first attempt of vein cannulation and at every subsequent attempt as applicable, and five minutes after the end of the procedure.

Key secondary outcome(s))
1. Skin conductance
2. regional cerebral tissue oxygen saturation (rcSaO2) using near-infrared spectroscopy (NIRS)
3. Hemodynamics (non-invasive blood pressure via automatic cuff pressure)
4. Heart rate measured with EKG
5. Peripheral capillary oxygen saturation (SpO2) using a saturation probe
6. Breath rate, assessed via a EKG monitor and observation by nurse

All the above secondary outcome (except for breath rate observation) measures will be recorded continuously from when the study drug is administered until one hour after the end of the procedure.
EKG, SpO2 and breath rate monitoring will continue for 24 hours.

Plasma concentration of study drug is also a secondary outcome measure. A total of three plasma samples during 24 hours will be analysed with population based pharmacokinetic methods.

Completion date
01/12/2017

Eligibility

Key inclusion criteria
1. Neonate admitted to neonatal intensive care unit or high dependency unit at Uppsala University Hospital
2. Discharge to ward planned after more than 24 hours
3. Planned insertion of a peripheral i v cannula or PICC, when a painful procedure is anticipated due to e g previous difficult i v access
4. Gestational age range: 33 - 44 weeks
5. Weight range: 1 - 5 kg

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Neonate

Sex
All

Key exclusion criteria
1. Age<33 weeks or > 44 weeks gestational age
2. Weight < 1 kg or > 5 kg
3. Patients that have received general anaesthesia, alpha-2-agonists or opioid analgesia within 12 hours preceding the start of the protocol
4. Signs of cardiac failure
5. Signs of respiratory failure

Date of first enrolment
01/10/2016

Date of final enrolment
30/09/2017

Locations

Countries of recruitment
Sweden

Study participating centre
Uppsala University Hospital
Neonatal Unit
Uppsala
Sweden
751 85

Sponsor information

Organisation
Uppsala County Council

ROR
https://ror.org/01dv86r63

Funder(s)

Funder type
Government

Funder Name
Uppsala County Council

Results and Publications

Individual participant data (IPD) sharing plan
Not provided at time of registration

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		12/08/2021	19/10/2022	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes