Intranasal Dexmedetomidine for Paediatric MRI Sedation at RDH

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1. Introduction

This guideline is intended for the use of Intranasal Dexmedetomidine for Paediatric MRI at the Royal Derby Hospital for sedation under the supervision of a Consultant Anaesthetist who is familiar with providing general anaesthesia for children in the MRI suite. Dexmedetomidine is an alpha-2-agonist licensed for sedation. It is available as an IV preparation, but can be used via the intranasal route for pre-operative sedation in children with severe anxiety, autism or obstructive sleep apnoea in whom it is important to avoid respiratory depression.

2. Aim and Purpose

To ensure Intranasal Dexmedetomidine is safely administered and provides optimal sedation for Paediatric MRI cases. The guideline provides information on the dose, preparation and administration technique required, along with guidance on timings and location.

3. Definitions, Keywords

Anxiolysis – reduction in anxiety, often due to a medication
Dexmedetomidine – a drug similar to clonidine in action that reduces anxiety and causes drowsiness
MAD device – Mucosal Atomization Device for intranasal use

4. Main body of Guidelines

MRI scans are very noisy and require a child to stay still in an enclosed space for a period of time to enable the images to be taken. This can be quite claustrophobic and many children struggle to stay still for the duration of the scan due to anxiety and fear. Commonly anaesthesia is used to complete these scans, but anaesthesia comes with its risk and complications. Depending on the age of the child other forms of sedative medication for MRI are available, but are often unsuccessful. Intranasal Dexmedetomidine provides another alternative for sedation and to help reduce the interventions required to have a successful MRI scan take place. Potentially improving the experience for the child and the parent in hospital and reducing the risks they are exposed to. For the most part, Intranasal Dexmedetomidine should be used for scans that last under 30 minutes.

Training Requirements

Intranasal dexmedetomidine should only be administered by anaesthetists and registered paediatric nurses trained in the use of the intranasal MAD device.

Procedure

Pre-admission

- All children should have written consent completed for MRI scan under sedation +/- general anaesthetic by responsible paediatrician or doctor ordering the scan.
- Telephone assessment by pre-operative nursing team for elective MRI
- They should be appropriately fasted as per hospital guidelines for sedation and general anaesthesia.
- The process of administering sedation and conducting the MRI scan should be explained to the child and parent/caregiver.

Admission

- Admission to Sunflower ward
- Nurse assigned who is experienced in administering/looking after patients who have been sedated
- Record baseline observations, weight and provide identity bracelet
- Anaesthetic assessment completed by anaesthetist and decision made for appropriateness for intranasal dexmedetomidine, verbal consent gained by anaesthetist
- MRI safety checklist needs completing prior to administering sedation
- Prescription to be completed by a Consultant Anaesthetist
- Avoid in <1yrs

Presentation

- Dexmedetomidine 100micrograms/ml solution for injection

Dose

- Intranasal dose: 2-4micrograms/kg
- Usual starting dose is 2microgram/kg
- Max dose 200migrograms
- Use lower end of range if any cautions
- Round to the nearest 5micrograms when prescribing

Preparation and Administration

- Ensure appropriate monitoring equipment available for transport, a full oxygen cylinder, oxygen mask, bag/valve/mask, suction and trolley
- Dexmedetomidine solution may be used undiluted (100 micrograms/ml), or diluted with sodium chloride 0.9% to a minimum volume of 0.8ml (divide between nostrils if appropriate)
- Draw up the required dose with a filter needle into a 1ml syringe
- Dilute with sodium chloride 0.9% if required to 0.8ml
- For doses >100 micrograms split the dose between two 1ml syringes
- Remove needle and attach the syringe firmly to a MAD nasal atomiser device
- Administer the dose into either or both nostrils, hold the atomiser in nostril for 5-10 seconds after administration
- Give 20-30mins before MRI scan time

INITIAL DOSING FOR INTRANASAL DEXMEDETOMIDINE

Weight	Dose @ 2 micrograms/kg	Preparation
10kg	20 micrograms	0.2ml 1 syringe, requires dilution
15kg	30 micrograms	0.3ml 1 syringe, requires dilution
20kg	40 micrograms	0.4ml 1 syringe, requires dilution
25kg	50 micrograms	0.5ml 1 syringe, requires dilution
30kg	60 micrograms	0.6ml 1 syringe, requires dilution
40kg	80 micrograms	0.8ml 1 syringe, no dilution
50kg	100 micrograms	1ml

		1 syringe, no dilution

Mucosal Atomization Device attached to a 1ml syringe

Monitoring

- Monitor pulse and oxygen saturations continuously after administration until end of procedure
- Monitor respiratory function
- Transported patients must be accompanied by a trained nurse
- After the MRI scan, the standard procedure for monitoring sedated patients should be instigated and standard discharge criteria met

Pharmacokinetics for intranasal route

- Onset: 30-45 minutes
- Peak effect: about 40 minutes
- Duration of action: 45-90 minutes

Side effects

- Mild bradycardia is expected
- Hypotension common
- Others: Abdominal distension, agitation, apnoeas, arrhythmias, atrioventricular block, dry mouth, dyspnoea, hallucinations, hyperglycaemia, hypertension, hyperthermia, hypoalbuminaemia, hypoglycaemia, metabolic acidosis, myocardial infarction, myocardial ischaemia, nausea, respiratory depression, thirst and vomiting.

Contraindications

- acute cerebrovascular disorder, bradyarrhythmias secondary to 2nd/3rd degree heart block or sick sinus syndrome (unless pacemaker fitted), uncontrolled hypotension

Cautions

- bradycardia, hypotension, ischaemic heart disease, severe cerebrovascular disease (especially higher doses), severe neurological disorders, spinal cord injury, abrupt withdrawal after prolonged use, malignant hyperthermia

Development of Guideline	Steven Sarno - Consultant Anaesthetist
Approved by	Surgery Division
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Key Contact	Steven Sarno