EVALUATION OF DEXMEDETOMIDINE SAFETY AND DOSING FOR OUTPATIENT PEDIATRIC ELECTROENCEPHALOGRAM

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Background

- Dexmedetomidine is an alpha-2 adrenoreceptor agonist with increasing use in pediatric procedural sedation
- Dexmedetomidine may offer specific advantages over other agents commonly used for procedural sedation for electrocardiograms (EEGs)
  - Unique mechanism of action
  - Limited hemodynamic and respiratory effects
  - No interference with EEG
- While many centers utilize dexmedetomidine for procedural sedation but few utilize a pediatric nurse practitioner under a physician protocol to administer dexmedetomidine during the EEG procedure

Objective

- Describe the safety and the dosing of dexmedetomidine during outpatient pediatric EEGs

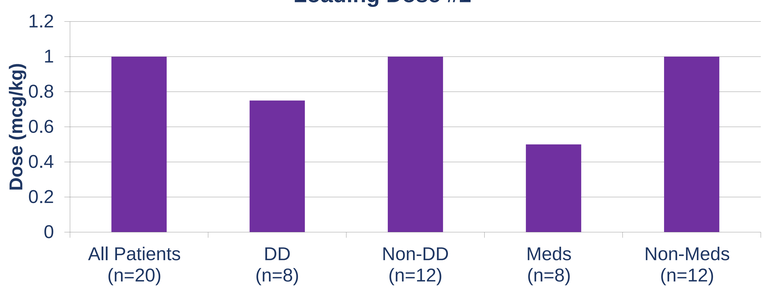
Methods

- IRB approved retrospective chart review in infants and children (0-18 years) who received dexmedetomidine during outpatient pediatric EEG procedures at Peyton Manning Children's Hospital during September 1, 2011 and June 30, 2015
- Dexmedetomidine protocol includes an initial bolus of 1 mcg/kg/dose. If patient not adequately sedated, second bolus of 0.5 mcg/kg/dose may be administered. Dexmedetomidine continuous infusion is initiated at 0.5 mcg/kg/hr.
- Data collected:
  - Patient demographics
  - Diagnosis of developmental delay, bronchopulmonary dyplasia, cardiac, renal or liver disease or history of prematurity
  - Medications for Autism Spectrum (ASD), Attention Deficit Hyperactivity (ADHD), seizures and/or allergies
  - Dexmedetomidine – loading dose(s) and continuous infusion rates
  - Vital signs
  - Interventions for hypotension, bradycardia and/or respiratory depression

Results

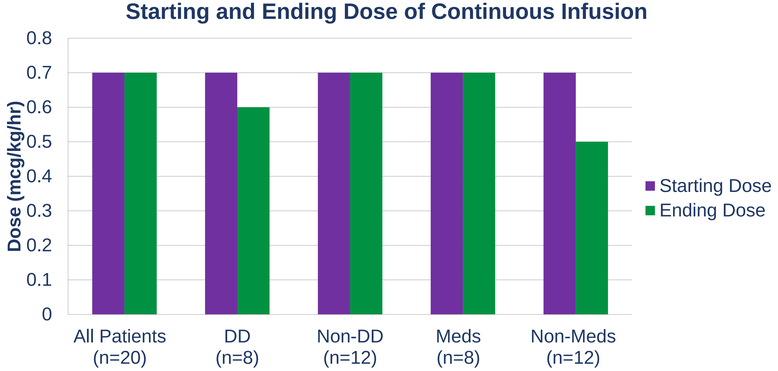
- Twenty patients were sedated using dexmedetomidine for EEG procedure
  - Mean age: 5.4 years (range: 1-13 years)
  - Mean weight: 22.6 kg (range: 10-48 kg)
  - 8 patients were developmentally delayed
  - 13 patients required medications for seizure disorder (5), ASD (4) and allergies (4)
- All patients received an initial bolus of 1 mcg/kg/dose
- A second loading dose was required in 70% (n=14) with a median dose of 1 mcg/kg/dose [IQR 0.5;1]
  - 64.3% (n=9) of patients received a second loading dose of 1 mcg/kg/dose

Loading Dose #2



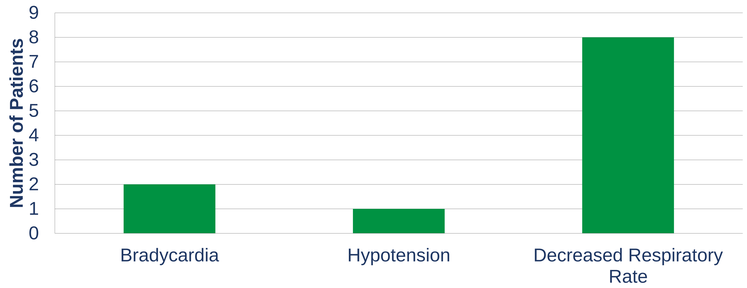
- Median dexmedetomidine infusion starting rate: 0.7 mcg/kg/hr [IQR 0.53;0.7]
- Median dose at completion of infusion: 0.7 mcg/kg/hr [IQR 0.5;0.7]

Starting and Ending Dose of Continuous Infusion



- The median EEG length was 40 minutes [IQR 30.75;45]
- EEG duration longer in developmentally delayed patients: 42.5 minutes [IQR 30.75;46.5] versus non-developmentally delayed patients: 37.5 minutes [IQR 31.25;40]
- EEG duration longer in patients receiving medications for ASD, seizures and/or allergies: 40 minutes [IQR 36;45] versus patients not receiving medications: 35 minutes [IQR 30;43.75]

Notable Events



- Overall, 10 patients (50%) experienced a notable event
  - 1 patient experienced 2 notable events
  - 2 patients (10%) experienced bradycardia
  - 1 patient (5%) experienced hypotension
  - 8 patients (40%) experienced decreased respiratory rate

Conclusion

- All patients followed the protocol and received an initial bolus of 1 mcg/kg/dose
- 64.3% of patients who required a second dose received a dose above protocol recommended dosing
  - This variation in the protocol suggests a revision to include an option for the second loading dose at 0.5 mcg/kg or 1 mcg/kg
- Starting rate was higher than recommended dosing at 0.66 mcg/kg/hr
  - This deviation suggests an increase to our initial infusion rate may be warranted
- Notable events recorded were not found to be clinically significant and no interventions during dexmedetomidine infusion or EEG procedure were performed

References

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- Mason KP et al. Effects of dexmedetomidine sedation on the EEG in children. Paediatr Anaesth. 2009. Dec;19(12):1175-83.
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Investigators have no conflicts of interest to disclose.