

Mini Review

Increase Use of Dexmedetomidine as Sedative in Pediatric Cardiac Intensive Care Unit in Riyadh Saudi Arabia

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Abstract

Background: Increase the use of Dexmedetomidine in pediatric cardiovascular intensive care unit intubated patients, Saudi Arabia, Riyadh.

Pediatric patients in our cardiac intensive care unit require sedation to maintain sedating them while there are on mechanical ventilation specially if going to last longer.

Objective: Dexmedetomidine is been introduced in pediatric after been approved by the food and drug administration in 1999 for adults receiving mechanical ventilation to provides sedation with minimal effects on respiratory function prior to, during, and following extubation also used as an alternative or adjunct to benzodiazepines and opioids in the pediatric intensive care setting. This is to review its increase use in our pediatric intensive care unit patients for its efficacy and safety including the dose and preparation.

Keywords: Dexmedetomidine; Sedation; Intensive care unit; Pediatric; Intubated

Introduction

Our pediatric cardiac intensive care unit in King Fahad Medical City has 14 beds, and the average patients on Dexmedetomidine are 4 patients a week.

There has been an increase this year in using dexmedetomidine with our new team of doctors compare to last year which was an average of one patient on monthly bases and it's due to the new data on this drug and its safety and tolerance.

Dexmedetomidine is a centrally acting α_2 -adrenergic agonist that has analgesic and hypnotic effects used in intensive care settings and surgery. Its properties include the ability to provide sedation without respiratory depression, also rapid clearance which results in a short elimination half-life [1,2].

We reviewed articles and studies regarding the use of dexmedetomidine for prolonged use in pediatric cardiovascular intensive care unit, it was found to be safe and effective [3].

It is also associated with decreased opioid and benzodiazepine requirement and dose [4].

In our intensive care unit a few months ago, Dexmedetomidine was highly prescribed to the Intubated pediatric cardiovascular intensive care unit either alone or with midazolam.

Citation: Cafege WO, Rashed F, Almuneef S. Increase Use of Dexmedetomidine as Sedative in Pediatric Cardiac Intensive Care Unit in Riyadh Saudi Arabia. *Anesthesiologist*. 2019; 1(1): 1001.

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Publisher Name: Medtext Publications LLC

Manuscript compiled: July 12th, 2019

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Drug Interactions

Dexmedetomidine administration with other sedatives agents gives a pharmacodynamic interaction resulting in enhanced sedation. This additive action usually permits a reduction in the dose of sedative agents with a more adverse effect profile, such as benzodiazepines. Despite that dexmedetomidine undergoes metabolism by cytochrome P450 enzymes, still no drug interactions involving this pathway have been identified [5].

The capability of dexmedetomidine to produce bradycardia or hypotension might increase by administration with other drugs producing those effects so more caution is needed when dispensing [6].

Preparations

Dexmedetomidine prepared in the pharmacy in 50 ml syringe as infusion with concentration of 200 mcg/50 ml or 400 mcg/50 ml in dextrose or normal saline.

Case Study

Three month old baby girl weighing 4 Kg admitted to our hospital and diagnosed to have tricuspid valve dysplasia, small right ventricular, pulmonary artery, atrial septal defect ventilated. She had a patent ductus arteriosus stent surgery. The patient was on midazolam 1 mcg/kg/minute and on the third day Dexmedetomidine 0.5 mcg/kg/hour was added. Today midazolam is hold and Dexmedetomidine is continue and tapered down to 0.3 mcg/kg/hour.

Table 1: Dexmedetomidine compatibility with our common ICU medications [6].

Epinephrine	Cefazolin	Potassium chloride
Norepinephrine	Ceftazidime	Magnesium sulphate
Dopamine	Piperacillin/tazobactam	Calcium gluconate
Dobutamine	Vancomycin	Methylprednisolone
Milrinone	Gentamycin	Heparin
Rocuronium	Ampicillin	Ranitidine

Results

Based on the patients in our unit, they are stable with good tolerance to Dexmedetomidine with increase number of patients received it from one to the average of four patients a week.

Conclusion

Recently, Dexmedetomidine use in pediatric cardiovascular intensive care unit is increased. It showed that it's well tolerated and effective in providing sedation/analgesia and decrease the dose of other sedative agents with no significant changes in blood pressure, heart rate, respiratory rate, or saturations of oxygen.

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