Wisconsin Perinatal Quality Collaborative (WisPQC)

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Dexmedetomidine use in a Level IV NICU

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Introduction: The use of dexmedetomidine has expanded owing to its anxiolytic properties with a limited effect on respiratory drive. There is relatively little literature regarding prolonged use in the NICU population particularly among premature infants.

Objectives: We aimed to better understand our dexmedetomidine use patterns, incidence of withdrawal and adverse events.

Intervention/practice: For infants receiving dexmedetomidine, we investigated dose, duration, transition to enteral clonidine and indication. We compared heart rate and blood pressure before and after drug initiation and evaluated if the medication was decreased or stopped within 24 hours of therapy initiation. The investigation was undertaken as part of a pain and sedation management quality improvement project.

Results: We reviewed all infants in our NICU from April 2018 through November 2019. Dexmedetomidine use was 7.6% overall and 27% among invasively ventilated infants. Among those infants receiving dexmedetomidine, 92% and 26% were on opioids and benzodiazepines, respectively, at initiation. The most common indications were surgery (48%) and clinical decompensation (47%). The median duration of use was 11 days with a maximum of 86 days. The median starting dose was 0.4 mcg/kg/hr and the maximal dose was 1.5mcg/kg/hr. Excluding those infants on inotropes at the onset of therapy (n=35), infants experienced a median 14 bpm decrease in heart rate and 9.5% developed hypotension defined as mean arterial blood pressure below postmenstrual age or below 40mmHg. In only one infant did heart rate drop below 100 BPM. The impact on heart rate and blood pressure was not more pronounced among premature infants. Excluding dose changes with extubation, 19% of infants had their dexmedetomidine decreased with 24 hours of initiation and 3% (n=4) had their infusion discontinued. 51% of infants on dexmedetomidine were transitioned to clonidine either for withdrawal or for continued sedation.

Conclusion/implications: We report a large cohort of preterm and term infants exposed to prolonged dexmedetomidine infusions. While we did encounter decreased heart rate and blood pressure with dexmedetomidine infusions only 19% of patients required down-titration in the first 24 hours and only 4 had their infusions discontinued. Dexmedetomidine is a valuable adjunct for sedation in premature and term infants particularly those requiring increased sedation post-operatively or in the setting of worsening clinical status.