

REDUCTION OF POST-OPERATIVE OPIOID USE IN NEONATES FOLLOWING CONGENITAL DIAPHRAGMATIC HERNIA REPAIRS: A QUALITY IMPROVEMENT INITIATIVE

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Background

A limited number of post-operative opioid reduction strategies exist for neonates. A standardized post-operative pain control regimen previously implemented in our neonatal intensive care unit (NICU) demonstrated reduced opioid use following gastrointestinal surgery. We evaluated our opiate reduction intervention in our open congenital diaphragmatic hernia (CDH) population given the complex nature of the post-operative course, which often requires prolonged ventilation and large cumulative opioid doses.

Methods

Our opioid reduction intervention was based on standing post-operative IV acetaminophen, post-surgical sign-out between the surgical and NICU teams and education seminars with NICU providers. We used a historical control (January 2011-April 2016) for our pre-intervention cohort and prospectively followed our post-intervention cohort (May 2016-September 2019). We performed a before-and-after analysis and utilized process control charts to investigate time trends in cumulative post-operative opioid use.

Results

A total of 39 patients were included in our investigation; 21 in our pre-intervention and 18 in our post-intervention cohort. The cohorts were clinically similar. The intervention reduced total post-operative opioid use by 96% (69.2 (morphine equivalents mg/kg) to 5.4 (morphine equivalents mg/kg), $p < 0.0001$). Our maximum Neonatal Pain and Agitation Sedation Score (N-PASS) over the first 48 hours were equivalent ($p = 0.669$). There were no differences in post-operative complications. A multivariable regression revealed ventilatory days were dependent on the size of the CDH defect and severity of the underlying pulmonary pathology, not our opioid reduction strategy.

Conclusion

A multi-tiered intervention based on standing IV acetaminophen, provider education and standardizing post-surgical hand-off can decrease opioid use in post-surgical neonates with complex surgical pathology including CDH. The intervention proposed in this investigation is safe and does not increase pain or sedation scores in neonates. Given the clinical and potential neurodevelopment benefits of limiting opioid use in neonates, this intervention may prove beneficial at other institutions.

XmR Chart(s) of Post-Operative Morphine Equivalents (mg/kg)

