

Introduction

- ▶ About 1.5 million infants undergo surgery requiring anesthesia each year in the USA (Garcia-Marcinkiewicz, 2020). Intubation of these patients carries great risk, especially neonates undergoing emergency procedures. Apnea in the neonate patient population leads to increased risk of cardiac arrest. Studies have shown that PaO2 (the measurement of oxygen pressure in arterial blood) when apneic decreases at a rate three times as great compared to the PaO2 in an adult (Hardman 2006). This means that the implications with difficulty in intubating are exacerbated due to the time constraint in which it is important to establish an airway with minimal time spent apneic. There are some ways to identify when an adult patient will have a difficult airway and intubation. This leads to utilization of specialized methods in order to establish an airway on the first try. This would be very important and impactful if it could be done effectively on patients in the neonate population. The implementation and utilization of a standardized algorithm to determine the likelihood of a difficult airway and intubation in the neonate population would likely decrease the adverse reactions that are caused by difficulties in establishing an airway.
- ▶ A study provided by Fiadjoe, Nishisaki, Jagannathan, et al. describes a thorough registry of risk factors for difficult tracheal intubation in pediatrics that includes information on the success rates of various intubation techniques, the complications that occurred, and descriptors of the effects of multiple attempts on the outcomes of the patients. The data was gathered from 13 different children’s hospitals in the USA. After collection of the data, it was compiled into a web registry and given different qualifications. The authors found that the most common first line attempts to establish an airway were done via direct laryngoscopy, fiberoptic bronchoscopy and indirect video laryngoscopy. Failure of establishing an airway occurred in 2% of cases with outcomes as severe as patient cardiac arrest. It was established by the study that more than two direct laryngoscopy attempts led to incidence of severe complications. This information can be used to study the impact it would have if it were included in a neonate difficult airway algorithm that is tested for effectiveness in many different hospitals.

Methodology

This study involved a population of one thousand neonates under the age of 1 month receiving surgeries in hospitals across the state of Florida. The surgeries were either emergent or ones that were serious enough in nature to justify intubation. The participants were split up into two groups. Group A was the population that had an anesthesia care team trained in a neonatal difficult airway algorithm and group B was part of a population that had an anesthesia care team trained without one. The difficult airway algorithm for the neonatal population will essentially look at the physical properties of the patient such as their height, weight, neck circumference and BMI. It will also look at other comorbidities the neonate has such as muscular disorders or other disease. This will be used to determine the “first try” method of intubation that has the greatest effectiveness in establishing the airway. Patient outcomes were analyzed, and any adverse anesthetic complications were noted in both populations. In addition, the amount of intubation attempts for each patient was recorded for both Group A and Group B. Whether or not a patient population was a part of one of the ones whose anesthesiology care team was trained in the difficult airway algorithm was recorded as well. If an adverse reaction occurred a score of 10 was given to the patient. If more than one attempt was made for the establishment of an airway then a score of 5 was given for two attempts to establish the airway, 8 for three attempts to establish the airway and a 10 when more than three attempts did not yield an established airway.



Results

Group A, the patient population whose anesthesia care team were trained in a neonatal difficult airway algorithm, would be expected to have less adverse outcomes caused by intubation failures and have less cases of more than one attempt at intubation compared to Group B.



Conclusion

This study, if conducted, showed that the establishment and utilization of a neonatal difficult airway algorithm showed marked improvement in the first-time intubation success rate. It also proved that the algorithm helps to reduce the complications that can occur from failure of establishing an airway quickly and effectively. The implication here is that a difficult airway algorithm should be included in formal anesthesia education and that it should be used in all hospitals and within all anesthesia groups. This will greatly reduce the complications of not effectively establishing an airway in the neonatal population.



References

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