Description of Airway Management Techniques in a general population of children from birth to one year.

Gálvez JA1,2, Acquah S2, Anand K1, Wasey JO1, Tan J1,2, Ahumada LM1, Simpao AF1,2, Rehman MA1,2, Fiadjoe JE1,2
Department of Anesthesiology and Critical Care Medicine - The Children’s Hospital Of Philadelphia - Philadelphia, PA1,
The University of Pennsylvania Perelman School of Medicine - Philadelphia, PA2.

Results

• 7,196 patients (4,595 female and 2,601 male) ASA 1-5 were included (Fig 1).
• The devices used in this population include: direct laryngoscope (85%), laryngeal mask airway (10.7%), video laryngoscope (1.3%) and fiberoptic bronchoscope (0.4%) (Fig 2).
• Twenty-three (0.4%) of the children were reported as difficult or impossible for mask ventilation.
• 20% of children in the 0-5 months group required multiple attempts for intubation compared to 11% of patients in the 6-11 month group (Fig 3 and 4).
• 97.5% of children required only one laryngoscopy device, and 2.5% of required more than one device for intubation.
• Video laryngoscope and fiberoptic bronchoscope were used more often in the 0-5 month group (71 v. 23).
• Laryngeal mask airways were used predominantly in the 6-11 month group (484 v. 31).

Background

• Children undergoing tracheal intubation may be at risk for airway injury as a result of multiple attempts at laryngoscopy with various devices.(1)
• A growing body of evidence suggests that multiple laryngoscopy attempts are associated with morbidity and mortality in children. (1-3)
• The aim of this study was to retrospectively describe the practice of tracheal intubation of children younger than 1 year of age in a large pediatric hospital system, with an emphasis on:
  • Number of laryngoscopy attempts
  • Types of devices used
  • Incidence of difficult mask ventilation

Methods

• The study was exempt from review by the IRB.
• A de-identified data set was retrieved consisting of all children younger than 1 year that received general anesthesia at The Children’s Hospital of Philadelphia between January 24, 2015 and August 1, 2016.
• Data elements included:
  o Age
  o Gender
  o ASA status
  o Number of insertion attempts
  o Type of airway device
    ▪ Laryngeal mask airway
    ▪ Endotracheal tube
  o Laryngoscopy technique
    ▪ Direct laryngoscopy
      ▪ Miller, Mac or Wis-Hipple blade
    ▪ Indirect Laryngoscopy techniques
      ▪ Video laryngoscope
      ▪ Fiberoptic bronchoscope
• Data exploration and analysis was conducted with visual analytics software (Qlikview, QlikTech, Radnor, PA) and R Studio (R Studio, Boston, MA).

References


Discussion

• The incidence of difficult or impossible mask ventilation is a rare occurrence.
• However, we observed 16.6% of patients required multiple attempts at laryngoscopy.
• There is an opportunity to improve practice by reducing the number of multiple laryngoscopy attempts in patients younger than one year of age.
• Direct laryngoscopy was predominantly used in this population, accounting for more than 80% of cases.