Introduction

Although rare, devastating neurologic outcomes can occur in pediatric patients with cervical spine injuries if the neck is improperly immobilized during tracheal intubation. However, cervical spine limitations can result in poor glottic visualization during direct laryngoscopy. Fortunately, advancements have been made in difficult airway management with the advent of video laryngoscopy. The purpose of this study is to compare intubation times between standard direct laryngoscopy and two different video laryngoscopes in children under the age of 2 years while utilizing manual in-line stabilization to simulate the restrictions encountered in patients with cervical spine injuries.

Methods

Patients under age 2 undergoing surgery requiring tracheal intubation were eligible for enrollment. Subjects were randomly assigned to undergo intubation using a GlideScope® (G), a Storz DC® video laryngoscope (S), or a standard Miller blade (DL) after standardized anesthetic induction with manual in-line stabilization. Patients with a history of difficult intubation, elevated intracranial pressure, or increased aspiration risk were excluded. Laryngoscopists were anesthesiology trainees who had completed at least one month of pediatric anesthesiology and proved basic proficiency with all three laryngoscopes as a pre-requisite. Time to first successful intubation was defined as the time in seconds from the initiation of intubation attempts to the successful intubation. Attempts, and glottic view were recorded. An intubation time difference of 10 seconds or greater was defined as clinically significant with p<0.05 considered statistically significant.

Results

35 patients were studied. There were no demographic differences between groups, except for a larger number of males in group G. There were no intergroup differences in laryngoscopist training level or average manikin intubation times.

There was no significant intergroup difference in time per laryngoscope use in the clinical setting. Intubation times for individual laryngoscopists increased significantly from the manikin to the clinical setting regardless of level of training (all p<0.01) but there was no significant overall difference in the magnitude of increase.

When evaluating intragroup statistics, level of training was not related to differences in clinical intubation time with the specific scopes.

There was no significant intergroup difference in maximal degree of neck motion during manual in-line stabilization.

Conclusion

The Neonatal Resuscitation Program recommends intubation time of 30 seconds or less in neonates.

Despite maintenance of manual in-line stabilization throughout intubation, the median time to intubation was near this for each of the 3 laryngoscopes studied.

Our results to date suggest that anesthesiology trainees are able to perform tracheal intubation in a timely manner using any of the studied laryngoscopes when intubating children <2 years old in whom cervical spine injury is a concern.

References