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To Compare the Effect of Video Vs Direct Laryngoscopy during Urgent Endotracheal Intubation

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Abstract: Recent evidence has suggested an increasing role of video laryngoscopy (VL) for emergency airway management. Video laryngoscopy is a form of indirect laryngoscopy in which the clinician does not directly view the larynx. The present study was conducted to compare the effect of video vs direct laryngoscopy during urgent endotracheal intubation. This study was conducted in the department of Anesthesia in year 2015. It included 120 patients who required emergency intubation. Patients were divided into 2 groups. Group I consisted of 60 subjects in which direct laryngoscope was used for intubation while group II consists of 60 patients in which Glidescope video laryngoscope was used for intubation. Data in real time on the number of attempts, nadir systolic blood pressure, nadir oxygen saturations, time to intubation, and complications were recorded. The patient's airway assessment, demographics, doses of sedatives used, and types of blades used was also recorded. Group I consisted of 60 subjects in which direct laryngoscope was used for intubation while group II consists of 60 patients in whom Glidescope video laryngoscope was used for intubation. The difference was non- significant (P-1). Average age in group I was 70 and in group II, it was 65. The average weight was 66.3 Kg and 64.5 Kg in both groups respectively. BMI was 24 and 22 in both groups. Acute Physiology and Chronic Health Evaluation II was 20.4 and 20 in both groups. Hypertension was seen in 32 in group I and 36 in group II patients. Diabetes mellitus was seen in 28 and 24 respectively. Asthma was seen in 5 and 2 patients. CAD was seen in 10 and 12 patients respectively. CHF was seen in 16 and 8 patients respectively. Renal failure was seen in 8 and 9 patients. Stroke was seen in 11 and 10 patients. COPD was seen in 18 and 16 patients. Cirrhosis was seen in 9 and 12 patients. HIV was seen in 2 and 3 patients. Malignancy was seen in 22 and 17 patients respectively. First-pass success was seen in 25 in group I and 42 in group II patients. 15 patients in group I and 6 in group II required > 2 attempts. Average number of attempts was 1.6 and 1.2 times in both groups. Time to intubation was 220 and 114 seconds. Need for attending intervention was 1 in both groups. Vomiting or aspiration was seen in 5 and 7 patients respectively. Esophageal intubation was required in 5 and 0 patients. Desaturation < 80% was seen in 6 and 3 patients respectively. Systolic blood pressure < 70 was seen in 7 and 5 patients. Cormack-Lehane grade 1 or 2 was 52% and 92% respectively. The difference was significant (P< 0.05). The Glidescope video laryngoscope showed improved glottic view and first-attempt success compared with direct laryngoscopes in nonparalyzed patients.

Keywords: Aspiration, Direct laryngoscope, Glidescope video laryngoscope

INTRODUCTION

Laryngoscopy is endoscopy of the larynx. It is a medical procedure that is used to obtain a view, for example, of the vocal folds and the glottis. Laryngoscopy may be performed to facilitate tracheal intubation during general anaesthesia or cardiopulmonary resuscitation or for surgical procedures on the larynx or other parts of the upper tracheobronchial tree[1]. Direct laryngoscopy is carried out by the laryngoscope and is inserted into the mouth on the right side and flipped to the left to trap and move the tongue out of the line of sight, and, depending on

the type of blade used, inserted either anterior or posterior to the epiglottis and then lifted with an upwards and forward motion. This move makes a view of the glottis possible. This procedure is most often employed by anaesthetists for endotracheal intubation under general anaesthesia, but also in direct diagnostic laryngoscopy with biopsy. It is extremely uncomfortable and is not typically performed on conscious patients, or on patients with an intact gag reflex [2].

Recent evidence has suggested an increasing role of video laryngoscopy (VL) for emergency airway management. Video laryngoscopy is a form of indirect laryngoscopy in which the clinician does not directly view the larynx. Instead, visualization of the larynx is performed with a fiberoptic or digital laryngoscope inserted transnasally or transorally [3]. The Macintosh or Miller blade has reported success rates as high as 95% in expert practitioners under controlled conditions. With the introduction of Glidescope video laryngoscopy multiple reports have demonstrated improved glottic visualization during elective intubations in the OR. However, increased success rates in the OR have only been demonstrated in patients with predicted difficult airways or among nonexpert practitioners [4].The present study was conducted to compare the effect of video vs direct laryngoscopy during urgent endotracheal intubation.

MATERIALS & METHODS

This study was conducted in the department of Anesthesia in year 2015. It included 120 patients who required emergency intubation. Patients were divided into 2 groups. Group I consisted of 60 subjects in which direct laryngoscope was used for intubation while group II consists of 60 patients in whom Glidescope video laryngoscope was used for intubation. Data in real time on the number of attempts, nadir systolic blood pressure, nadir oxygen saturations, time to intubation, and complications were recorded. The patient's airway assessment, demographics, doses of sedatives used, and types of blades used was also recorded.

An attempt was defined as the action of inserting a laryngoscope into the oropharynx. Each instance of laryngoscope removal and reinsertion was counted as a subsequent attempt whether by the original or a more senior operator. First-attempt success was noted when the trachea was intubated during the first insertion of the laryngoscope. Duration of the intubation sequence was defined as the time from the first attempt at insertion of the laryngoscope to the confirmation of tube placement in the trachea by the use of a Co2 detector. "Urgent" endotracheal intubation was defined as an intubation performed in the setting of acute respiratory failure. "Emergent" endotracheal intubation was defined as an intubation performed in the setting of respiratory or cardiac arrest. "Elective" intubation was defined as an intubation performed solely for the purpose of ventilatory support during a procedure. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table 1 shows that group I consisted of 60 subjects in which direct laryngoscope was used for intubation while group II consists of 60 patients in which Glidescope video laryngoscope was used for intubation. The difference was non- significant (P-1). Table 2 shows baseline characteristics of both groups. The average age in group I was 70 and in group II, it was 65. The average weight was 66.3 Kg and 64.5 Kg in both groups respectively. BMI was 24 and 22 in both groups. Acute Physiology and Chronic Health Evaluation II was 20.4 and 20 in both groups. Hypertension was seen in 32 in group I and 36 in group II patients. Diabetes mellitus was seen in 28 and 24 respectively. Asthma was seen in 5 and 2 patients. CAD was seen in 10 and 12 patients respectively. CHF was seen in 16 and 8 patients respectively.

Renal failure was seen in 8 and 9 patients. Stroke was seen in 11 and 10 patients. COPD was seen in 18 and 16 patients. Cirrhosis was seen in 9 and 12 patients. HIV was seen in 2 and 3 patients. Malignancy was seen in 22 and 17 patients respectively.

Table 3 shows that first-pass success was seen in 25 in group I and 42 in group II patients. 15 patients in group I and 6 in group II required > 2 attempts. Average number of attempts was 1.6 and 1.2 times in both groups. Time to intubation was 220 and 114 seconds. Need for attending intervention was 1 in both groups. Vomiting or aspiration was seen in 5 and 7 patients respectively. Esophageal intubation was required in 5 and 0 patients. Desaturation < 80% was seen in 6 and 3 patients respectively. Systolic blood pressure < 70 was seen in 7 and 5 patients. Cormack-Lehane grade 1 or 2 was 52% and 92% respectively. The difference was significant (P< 0.05).

Table-1: Distribution of patients

Total - 120		
Group I (Direct laryngoscopy)	**Group II (Direct laryngoscopy)**	**P value**
60	60	1

Table-2: Baseline characteristics

	Group I	Group II
Age	70	65
Weight	66.3	64.5
BMI	24	22
Acute Physiology and Chronic Health Evaluation II	20.4	20
Hypertension	32	36
Diabetes mellitus	28	24
Asthma	5	2
CAD	10	12
CHF	16	8
Renal failure	8	9
Stroke	11	10
COPD	18	16
Cirrhosis	5	7
HIV	2	3
Malignancy	22	17

Table-3: Success rate and complications in both groups

	Group I	Group II	P value
First-pass success	25	42	0.02
Required > 2 attempts	15	6	0.01
Average number of attempts	1.6	1.2	0.05
Time to intubation (s)	220 seconds	114 second	0.01
Time to intubation (s) when only one attempt required	72.2 seconds	64.4 seconds	0.5
Need for attending intervention	1	1	1
Witnessed vomiting or aspiration	5	7	0.1
Esophageal intubation	5	0	0.01
Desaturation < 80%	6	3	0.3
Hypotension (systolic blood pressure < 70)	7	5	0.2
Cormack-Lehane grade 1 or 2	52%	92%	0.01

DISCUSSION

Successful tracheal intubation during general anaesthesia traditionally requires a line of sight to the larynx attained by positioning the head and neck and using a laryngoscope to retract the tongue and soft tissues of the floor of the mouth. Difficulties with intubation commonly arise, and alternative laryngoscopes that use digital and/or fibreoptic technology have been designed to improve visibility when airway difficulty is predicted or encountered [5]. The present study was conducted to compare the effect of video vs direct laryngoscopy during urgent endotracheal intubation.

The average age in group I was 70 and in group II, it was 65. The average weight was 66.3 Kg and 64.5 Kg in both groups respectively. BMI was 24 and 22 in both groups. This is similar to Laktikova *et al*. [6].Acute Physiology and Chronic Health Evaluation II was 20more in group I than group II. Hypertension was seen in 32and diabetes mellitus in 28 in group I and 36 and 24 respectively. This is in accordance to Noppens *et al*.[7].

We found that asthma was seen in 5 and 2 patients, CAD was seen in 10 and 12 patients and CHF was seen in 16 and 8 patients respectively. This is in accordance to Mosier *et al*. [8]. We found that renal failure was seen more in group II and stroke in group I. COPD was seen more in group I than group II.

We found that first-pass success was seen more in group II than group I. More group I patients required > 2 attempts. Average number of attempts was 1.6 and 1.2 times in both groups. This is in accordance to Sakles *et al*. [9].

Time to intubation was more in group I as compared to group II. Esophageal intubation was required more in group I than group II. Desaturation < 80% was seen in 6 and 3 patients respectively. Systolic blood pressure < 70 was seen in 7 and 5 patients. Cormack-Lehane grade 1 or 2 was 52% and 92% respectively. This is in accordance to Schwartz *et al*. [10].

CONCLUSION

The Glidescope video laryngoscope showed improved glottic view and first-attempt success compared with direct laryngoscopes in nonparalyzed patients.

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