Original Article

A comparison of GlideScope and Kings Vision-guided endotracheal intubation in patients with simulated difficult airway – A randomized control trial

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Introduction: Airway management is of paramount importance difficult intubation, often unexpected, which has been identified as most common contributory factor to anesthetic-related death. Laryngoscopy with conventional Macintosh laryngoscope involves extension of head and flexion which can be a potential risk in patients with unstable cervical spine. The purpose of this study is to compare the efficacy and visualization of glottic structure with Kings Vision video laryngoscope to GlideScope in patient with simulated difficult airway. **Methods:** This is a randomized control trial. After obtaining informed and written consent, 80 patients were randomly divided into two groups: Group 1 used GlideScope and Group 2 used Kings Vision (non-channeled) video laryngoscope to intubate patients with simulated difficult airway. Pre-operative airway assessment was done. Intraoperative indices were observed and noted such as POGO score, efficacy, and hemodynamic parameters which were noted for each attempt. Data were represented in form of mean and SD. **Results:** Statistically, no significant difference was seen in mean heart rate, systolic blood pressure, and diastolic blood pressure in both groups. Mean age of patients in Group 1 was 35.6 ± 9.2 years and in Group 2 was 36.0 ± 10.2 years. Mean laryngoscopic view (pogo score) in Group 1 was 99.0 ± 3.2 and in Group 2 was 98.0 ± 6.3. Esophageal intubation was not present in any of the group GlideScope and Kings Vision video laryngoscope group. **Conclusion:** The use of GlideScope resulted in better glottic view, easier intubation, than Kings Vision video laryngoscope in patients with simulated difficult airway.

KEY WORDS: GlideScope, King Vision-guided endotracheal intubation, Cervical spine

INTRODUCTION

The experience and expertise of an anesthesiologist in management of airway plays a key role in both emergency as well as elective cases to maintain paramount oxygenation and prevent any undesirable results. Inability to secure an airway efficiently has been considered as most common cause of fatality due to anesthesia. Difficult airway intubation, often unexpected, has been the leading precipitating factor for anesthetic-related death.

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Kings Vision video laryngoscope is of two types – one is channel and other non-channel. The display has organic light emitting diode designed for better resolution video. The GlideScope can be reused, it is a video laryngoscope with a light source and a digital video camera at the tip of the blade. Curvature of the blade is 60° with an antifogging system. LCD monitor displays the picture.

The aim of our study is to compare the efficacy and success rate, visualization of glottis structure, and intubation ease with GlideScope to Kings Vision video laryngoscope system in patient with simulated difficult airway.

Aim

This study was a comparison of Glidescope and Kings Vision video laryngoscope-guided endotracheal intubation in patients with simulated difficult airway.

Objectives

The objectives of this study were as follows:

- To assess and compare various parameters while performing laryngoscopy and endotracheal intubation using GlideScope and Kings Vision in patients with simulated difficult airway in terms of:
  1. Perturbations in hemodynamic parameters
  2. Pogo score
  3. Esophageal intubation

Place of Study

This study was Rohilkhand Medical College and Hospital, Bareilly.

Type of Study

This study was randomized controlled study.

It will be divided in two groups:

- Group A: GlideScope video laryngoscope will be used
- Group B: Kings Vision (non-channeled) video laryngoscope will be used

Time Duration of Study

This study was November 1, 2020–October 31, 2021.

Subjects

Patients posted for elective surgery of different specialties.

Sample Size

In this study, we will have two groups to do the comparison. Sample size is taken to be 40 in each group as per statistical calculations which are done using the software power and sample size program.[1]

(Alfa (α) – Type 1 error = 10%, Delta (δ) =7, Sigma (σ) =, Power = 0.7, P_0=0.96, P_1=0.81)

- P_O – Proportion of outcome in Group A = 0.96
- P_1 – Proportion of outcome in Group B= 0.81.

Approval by Board of Thesis/Research committee, Department of Anesthesiology, and Institutional Ethics committee was taken.

Study was registered in CTRI with NO. CTRI/2021/11/037712.

Inclusion Criteria

The following criteria were included in the study:

Patients fulfilling the following:

1. American society of anesthesiologist grade I or II
2. Between 18 and 60 years of either sex
3. Posted for elective surgery of different specialties.

Exclusion Criteria

The following criteria were excluded from the study:

1. Anticipated difficult airway – Mallampatti grade ≥III, thyromental distance < 6 cm, and inter-incisor distance <3.5 cm, with history of difficult airway
2. Emergency surgery
3. Full stomach
4. Cardiovascular diseases and uncontrolled hypertension
5. High intracranial pressure.

MATERIALS AND METHODS

Random division of patients in two groups was done: Group "A" and "B." In Group "A," GlideScope was used and in Group B, King Vision (non-channeled) video laryngoscope was used to intubate patient with simulated difficult airway. On the day of surgery, intravenous fluid was started 30 min before surgery. Monitor was attached and baseline readings were taken. The patient was premedicated with injection ranitidine 50 mg intravenous, injection ondansetron 4 mg intravenous, injection glycopyrrolate 0.2 mg intravenous, injection midazolam 1 mg intravenous, and injection but orphanol 1 mg intravenous. Induction was done with injection propofol 2.0 mg/kg intravenous and injection succinylcholine 1.5 mg/kg intravenous was used to accomplish muscle relaxation. Endotracheal intubation was done using standard protocol/technique with either Kings Vision laryngoscope or GlideScope. Confirmation of successful placement of endotracheal tube and bilateral ventilation was done by adequate chest rise, auscultation, and end tidal CO_2 (Et CO_2). All indices pertaining to the act of intubation were recorded and entered in the designated pro forma.

Heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial blood pressure, and arterial O_2 saturation were recorded after induction, then immediately after intubation, and after 1 min, 3 min, 5 min, and 10 min of intubation. Maintenance was done with O_2 and N_2O in the ratio 40:60, isoflurane, and vecuronium.

OBSERVATION

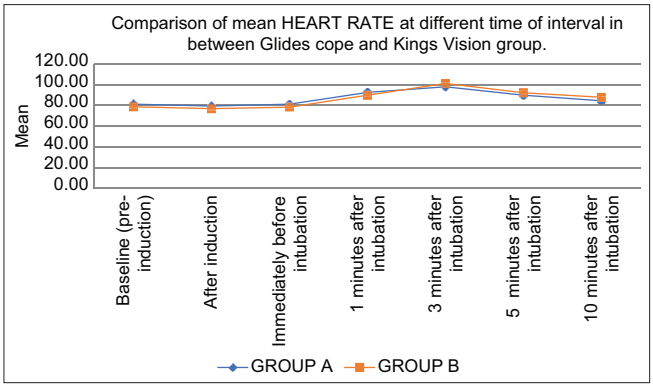
Table 1: Comparison of mean heart rate at different time of interval in between GlideScope and Kings Vision group

Heart rate	Group A	Group B	*P*-value
	Mean±SD	Mean±SD	
Baseline (Pre-induction)	72.8±2.15	73.4±2.36	>0.05 (Not significant)
After induction	86.0±2.91	86.8±2.68	>0.05 (Not significant)
Immediately before intubation	78.0±1.7	78.6±1.8	>0.05 (Not significant)
1 min after intubation	104.2±2.57	105.1±2.16	>0.05 (Not significant)
3 min after intubation	99.0±1.05	99.6±1.21	>0.05 (Not significant)
5 min after intubation	96.5±1.35	96.9±1.48	>0.05 (Not significant)
10 min after intubation	92.0±1.89	92.4±1.62	>0.05 (Not significant)

Table 2: Comparison of mean SBP at different time of interval in between glides cope and Kings Vision group

SBP	Group A	Group B	*P*-value
	Mean±SD	Mean±SD	
Baseline (pre-induction)	136.6±3.75	135.8±3.62	>0.05 (Not significant)
After induction	124.5±3.37	125.4±3.63	>0.05 (Not significant)
Immediately before intubation	120.6±1.65	121.3±1.94	>0.05 (Not significant)
1 min after intubation	173.2±4.34	174.6±4.62	>0.05 (Not significant)
3 min after intubation	162.2±1.75	163.2±1.72	>0.05 (Not significant)
5 min after intubation	149.4±1.9	150.3±1.8	>0.05 (Not significant)
10 min after intubation	139.8±1.99	140.3±1.89	>0.05 (Not significant)

SBP: Systolic blood pressure



Graph 1: Comparison of mean heart rate between two groups

Table 3: Comparison of mean DBP at different time of interval in between glides cope and Kings Vision group

DBP	Group A	Group B	*P*-value
	Mean±SD	Mean±SD	
Baseline (pre-induction)	72.4±1.58	72.9±1.62	>0.05 (Not significant)
After induction	62.2±1.75	63.3±1.68	>0.05 (Not significant)
Immediately before intubation	61.4±1.35	62.8±1.42	>0.05 (Not significant)
1 min after intubation	93.2±2.35	94.4±2.26	>0.05 (Not significant)
3 min after intubation	90.0±1.25	90.8±1.14	>0.05 (Not significant)
5 min after intubation	79.7±1.25	80.3±1.36	>0.05 (Not significant)
10 min after intubation	70.8±1.4	71.6±1.8	>0.05 (Not significant)

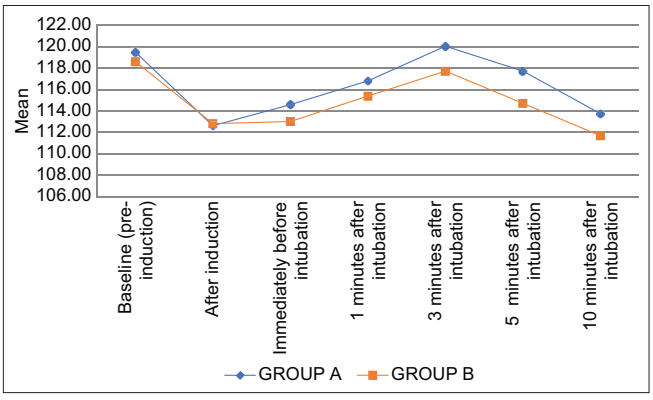
DBP: Diastolic blood pressure

Table 4: Pogo score of patients intubated with GlideScope and Kings Vision laryngoscope group

Variables	Group A	Group B	*P*-value
	Mean±SD	Mean±SD	
Laryngoscopic view (pogo score)	99.0±3.2	98.0±6.3	>0.05 (not Significant)

Table 5: Esophageal intubation

Variables	Group A	Group B	*P*-value
	No (%)	No (%)	
Esophageal intubation			
Yes	0 (0)	0 (0)	0.05 (Not significant)
No	40 (100)	40 (100)	

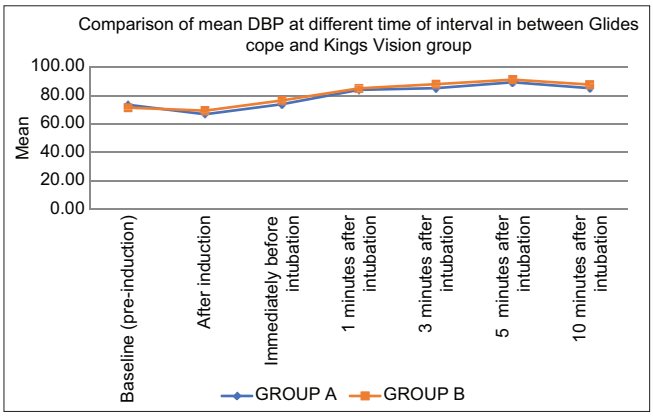


Graph 2: Comparison of mean SBP between two groups

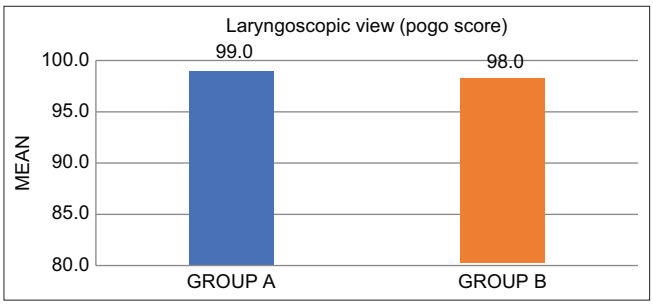
DISCUSSION

Hemodynamic Variables

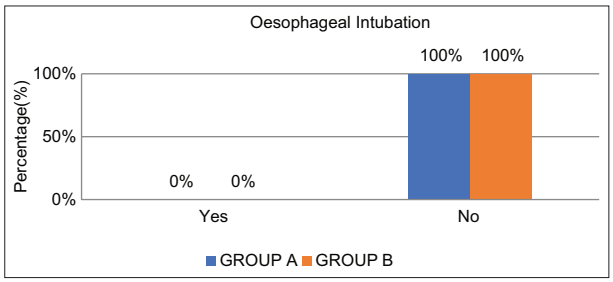
Hemodynamic changes to laryngoscopy and intubation is a result of oropharyngeal stimulation produced by laryngoscopy



Graph 3: Comparison of mean DBP between two groups



Graph 4: Comparison of POGO score between two groups



Graph 5: Comparison of oesophageal intubation between two groups

and stimulation by tube insertion. In our study, we found no such significant difference in hemodynamic parameters of the patient including (HR, SBP, DBP, and SPO_2). Reason may be the use of videolaryngoscope in both groups [Tables 1-3 and Graphs 1-3].

Hemodynamic response in Biro and Schlaepfer (2018) study showed no difference between the channeled and non-channeled scope to laryngoscopy. They also recorded lowest SPO_2 values in both groups and they recorded 98% as the lowest SPO_2 value in both groups. This study demonstrates that mean time in both the groups had slight difference and with proper premedication of the patient. The reason being less manipulation to align the axes and the second reason being the similar time to intubate the trachea with both the laryngoscope.[2]

In Nagat *et al*. (2020), the hemodynamic parameters were recorded pre-induction, after induction, 1 min, 3 min, 5 min, 10 min, and 15 min and evaluated that HR and mean blood pressure in both groups GlideScope and Kings Vision increased during laryngoscopy then slightly decreased after 3 min, 5 min, and returned to baseline after 10 min. In this study, the use of different but videolaryngoscope showed no significant difference in hemodynamic parameters.[3]

Visualization of Glottic Structure

POGO score refers to the percentage of glottic opening seen directly visualizing with a scope, there was no significant difference in POGO score for both the groups ($P > 0.05$), whereas there was a significant difference in C/L grading, in Group A, 28 patients had Grade 1 and 12 had Grade 2, in Group B, 20 patients had Grade 1 and 20 patients had Grade 2. There was mild lifting force required in all 40 patients in Group A and in Group B, 20 patients required mild and 20 patients required moderate lifting force ($P < 0.05$) [Table 4 and Graph 4].

Ali *et al.* (2017*)* and Shravanalakshmi *et al*. (2017) both concluded that videolaryngoscope had a better glottis visualization than direct laryngoscope and lesser time was needed for successful intubation.[4,5]

There was statistically no significant difference in oesophageal intubation in both the groups, as shown in Graph 5.

CONCLUSION

The following conclusion could be drawn from the study:

1. The King Vision videolaryngoscope had screen mounted on the device which made it difficult to insert into the mouth of the patient during laryngoscopy due to the thickness of the blade and the cervical immobility (MILS) provided to the patient. GlideScope, on the other hand, did not have such problem in scope introduction
2. Once it was put into the mouth of the patient, less optimization maneuvers were required for GlideScope laryngoscope. The ease of endotracheal intubation was better for the GlideScope as it was compared to the Kings Vision videolaryngoscope
3. Hemodynamic response to intubation was similar in both laryngoscope groups
4. Complication rate was negligible in both laryngoscope groups.

REFERENCES

1. Gupta P, Singh N. Sample Size Estimation. How to Write the Thesis and Protocol. Vol. 1. India: Jaypee Brothers Publisher; 2014. p. 89-90.
2. Biro P, Schlaepfer M. Tracheal intubation with channeled vs. non-channeled videolaryngoscope blades. Rom J Anaesth Intensive Care 2018;25:97-101.
3. EL-Shmaa NS. Evaluation of King's vision videolaryngoscope and glidescope onhemodynamic stress response to laryngoscopy and endotracheal intubation. J Anaesthesiol Clin Pharmacol 2020 1;36:233.
4. Ali Q, Amir SH, Ahmed S. A comparative evaluation of King Vision video laryngoscope (channelled blade), McCoy, and Macintosh laryngoscopes for tracheal intubation in patients with immobilized cervical spine. Sri Lankan J Anaesthesiol 2017;25:70-5.
5. Shravanalakshmi D, Bidkar PU, Narmadalakshmi K, Lata S, Mishra SK, Adinarayanan S. Comparison of intubation success and glottic visualizationusing King Vision and C-MAC videolaryngoscopes in patients with cervicalspine injuries with cervical immobilization: A randomized clinical trial. Surg Neurol Int 2017;8.