Journal of Cardiovascular Disease Research

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

# Assessment of King Vision Videolaryngoscope versus Truview Laryngoscope with respect to hemodynamic changes and intubation quality in patients with presumptive difficult intubation.

**[1]Dr Humaira Bashir, [2]Dr Falak Ara , [3]Dr Bashir Ah Mir**

*[1,2]senior residents in SKIMS soura*

*[3]Prof varun arjun medical college Shahjahanpur*

*Corresponding Author:* ***Dr Bashir Ah Mir***

**Abstract**

**Background-** Difficulties in airway management increase the risk of hypoxia, which can also lead to devastating neurological outcome.

**Objective-** To compare Kingvision and Truview Video Laryngoscope with respect to Hemodynamic changes and intubation quality in difficult intubation.

**Methods-** After obtaining approval from the Institutional Ethic Committee, the present, prospective, randomized study "assessment of Kingvision video laryngoscope vs Truview video laryngoscope with respect to hemodynamic changes and intubation quality in patients with presumptive difficult intubation." was conducted in the Post-Graduate Department of Anaesthesiology and Intensive care, Acharya Shri Chander College of Medical Sciences and Hospital, Jammu over a period of one year. 80 patients undergoing elective surgery requiring tracheal intubation were randomly assigned to undergo intubation using Kingvision, Truview to compose equal groups of 40 each. All intubations were performed by a senior anesthesiologist who has an experience of at least 40 intubations in patients using VL.

**Results-** Majority of the patients were in the age group of 20-50 years; Kingvision (33;82.5%), Truview (33;82.5%). Mean age ±SD in Kingvision group was 39.65±11.51years, Truview group was 40.05±10.59 years. All groups were comparable with respect to mean age (p=0.784). Female patients dominated the Kingvision group while male dominated theTrueview. The mean time of intubation was equivalent between Kingvision and Truview group (8.95 VS 8.95 sec; p=0.083). In both groups mean heart rate increased immediately after intubation but thereafter dropped gradually to near normal till 10 minutes after intubation. The difference in both groups at different time intervals was statistically not significant.

**Conclusion-** Although the duration of intubation was lesser in both the Kingvision and Truview video laryngoscope the difference was not statistically significant. Both the video laryngoscopes were found to be comparable in requirement of optimisation manoeuvres and need of second attempt for intubation. Hemodynamic response however was comparable in all the both laryngoscopes.

**Keywords-** Videolaryngoscopy, difficult intubation, Kingvision video laryngoscopy, Truview Video Laryngoscopy, heart rate.

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

## Introduction-

Endotracheal intubation is critical for securing the airway in various situations. It is being practiced since its inception into anaesthetic practice by Rowbotham and Magil in 1921. It is considered the best method for management of the airway under a variety of circumstances, as it provides the most reliable means of oxygenation and ventilation and besides providing greatest protection against regurgitation and aspiration of pulmonary contents.[1]

Difficulties in airway management increase the risk of hypoxia, which can also lead to devastating neurological outcome. The American Society of Anaesthesiologists Closed Claim study showed that difficult intubation or oesophageal intubation is the cause of approximately 35% of life threatening respiratory events, including death and permanent brain damage.[2]

Failed or difficult intubation is also associated with complications, such as an increased risk of hypertension, desaturation, unexpected admissions to the intensive care unit (ICU) and death (Caplan RA et al., 1990).[3] Such difficulties during intubation are estimated to occur in 1% to 6% of cases whereas failed intubation occurs in only 0.1% to 0.3% of cases (Crosby et al., 1998).[4] Therefore, airway problems con-tribute significantly to perioperative morbidity and mortality.

Video laryngoscopes have been developed by combining features of classic laryngoscopes and fibre-optic bronchoscopes in an effort to increase intubation success rates and to decrease anaesthesia-related morbidity and mortality.

Videolaryngoscopy is a newly developed technique to improve tracheal intubation success. It was made to bypass the need of directly visualising the glottic inlet. Both direct laryngoscopes and video-laryngoscopes comprise of a handle and a blade. However, there is a video camera fitted at the end of the video laryngoscope blade, facilitating visualization of the glottis indirectly on a screen. Both types of laryngoscopes have common features, so that physicians who are familiar to use DL can use VLs with minimal added training.[5]

Studies suggest that the use of video laryngoscopes improves the visualization of larynx. The Truview Video laryngoscope and Kingvision Video Laryngoscope are two novice Video Laryngoscopes that are portable and easy to use.[6]

The King Vision Video Laryngoscope was introduced into practice in 2010.It is a portable, battery operated, rigid, video laryngoscope that incorporates an integrated reusable display, reusable video adapters and a choice of disposable blades. It is ergonomically designed with an integrated blade/handle for maximum control and minimal lifting of soft tissue and impact on teeth. The main reusable component of the King

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

Vision Video Laryngoscope is a durable, high quality, portable, battery operated dis-play with a TFT LCD (Thin Film Transistor Liquid Crystal Display) screen.[7]

The Truview Video laryngoscope has a Macintosh-type blade. The laryngoscope is based on combination of an optical system with a steel blade, provides a 42 degree angled view through a 15mm eyepiece to give angular view of the glottic area. The eyepiece can be connected to an endoscopic camera head with a monitor, allowing audience to view the procedure. In addition, the truview blade has a port which connects to the auxiliary oxygen flow of the anaesthesia machine; it prevents misting and clears secretions from the lens and provides continuous oxygen insufflations during intubation. This may be helpful in patients who have poor pulmonary function.[8]

This study was done to assess the comparison of both Video Laryngoscope towards Hemodynamic and intubation quality in difficult intubation.

**Materials and Methods-**

After obtaining approval from the Institutional Ethic Committee, the present, prospective, randomized study "assessment of Kingvision video laryngoscope vs Truview video laryngoscope with respect to hemodynamic changes and intubation quality in patients with presumptive difficult intubation was conducted in the Post-Graduate Department of Anaesthesiology and Intensive care, Acharya Shri Chander College of Medical Sciences and Hospital, Jammu over a period of one year. 80 patients undergoing elective surgery requiring tracheal intubation were randomly assigned to undergo intubation using Kingvision, Truview to compose equal groups of 40 each. All intubations were performed by a senior anesthesiologist who has an experience of at least 40 intubations in patients using VL.

After obtaining informed written consent from patients, they were allocated into one of the 2 study groups randomly according to a computer generated table of randomisation, each group comprising of 40 patients.

 GROUP I (n=40): Patients in this group were intubated using Kingvision videolaryngoscope standard (non channelled) blade.

 GROUP II (n=40): Patients in this group were intubated using Truview videolaryngoscope.

INCLUSION CRITERIA:

1. Patients of either sex
2. Age 20-70
3. MPG grade III and IV

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

EXCLUSION CRITERIA:

The following patients were excluded in this study:

1. Patient refusal

2. Age < 20 and > 70 years

3. ASA III and IV

4. Patients with risk of pulmonary aspiration of gastric contents (e.g. pregnancy, diabetes)

5. Patients with history of cardiovascular disorder

6. Patients with raised intracranial pressure.

**Methodology-**

After Pre-anaesthetic preparation, on the morning of surgery in the preoperative room intravenous access with an 18 G or 20 G cannula was secured and I.V. fluid Ringer Lactate was started at 60ml/hr. The patients were administered Injection ondansetron 0.1mg/kg iv and injection pantoprazole 40mg intravenously prior to induction.

After adequate pre-oxygenation, standard general anaesthetic techniques were followed in all 2 groups using Injection Fentanyl 1microgram/kg and Injection Propo-fol 2mg/kg intravenously. Muscle relaxation was achieved with Injection Succinyl-choline 1mg/kg intravenously. Intubation was attempted after 60 seconds of giving Injection Succinylcholine.

All the intubations were done by the same experienced anaesthesiologist and the head was kept in “neutral position”. Stylet was used for intubation in all 2 groups. Size 3 of Kingvision standard (non channelled) blade and medium sized Truview blade were used for patients upto 50 kg . Size 3 kingvision standard (non channelled) blade and large sized Truview blade were used for patients having more than 50kg weight.

After successful intubation anaesthesia was maintained with 33% Oxygen & 66% Nitrous Oxide mixture & varying concentrations of Isoflurane (1-1.5%). Neuromuscular blockade was maintained by Injection Rocuronium 0.15 mg/kg. After completion of the surgery neuromuscular blockade was reversed with – Injection Neostigmine 0.05mg/kg and Injection Glycopyrrolate 0.01mg/kg. Hemodynamic parameters like Heart rate and Blood pressure were compared.

**Statistical Analysis-**

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

At the end of the study all the data was compiled and analyzed statistically. Comparison of mean value among the three groups was done using students t-test and percentage comparison was done using the chi square test. To compare more than two variables ANOVA test was used. The P value of less than 0.05 was considered statistically significant.

**Results-**

## Table 1. Age and Sex distribution of patients

| | | GROUP | | Total |
|---|---|---|---|---|
| | Age Group(in years) | **KINGVISION I** | **TRUVIEW II** | |
| **AGE** | **20 - 30** | 10 | 8 | 18 |
| | | 25.0% | 20.0% | 18.3% |
| | **31 - 40** | 13 | 15 | 28 |
| | | 32.5% | 37.5% | 35.0% |
| | **41 - 50** | 10 | 10 | 20 |
| | | 25.0% | 25.0% | 28.3% |
| | **51 - 60** | 6 | 7 | 13 |
| | | 15.0% | 17.5% | 17.5% |
| | **61+** | 1 | 0 | 1 |
| | | 2.5% | .0% | .8% |
| Total | | 40 | 40 | 80 |

As per table 1 Majority of the patients were in the age group of 20-50 years; Kingvision (33;82.5%), Truview (33;82.5%). Mean age ±SD in Kingvision group was 39.65±11.51years, Truview group was 40.05±10.59 years. All groups were comparable

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

with respect to mean age (p=0.784). Female patients dominated the Kingvision group while male dominated theTrueview. Male to female ratio was 0.90:1, 1.22:1 respectively in the 2 groups.

**Table 2- MPG distribution of patients**

| | | GROUP | | Total |
|---|---|---|---|---|
| | | **KINGVISION I** | **TRUVIEW II** | |
| **MPG GRADE** | **III** | 26 | 25 | 51 |
| | | 65% | 62.5% | 62.5% |
| | **IV** | 14 | 15 | 29 |
| | | 35% | 37.5% | 37.5% |
| Total | | 40 | 40 | 80 |
| | | 100.0% | 100.0% | 100.0% |

As per table 2 Majority of the patients in all 2 groups were MPG grade III (65%, 60% respectively). Statistically, there was no difference in the distribution (p> 0.05).

**Table 3- Comparison of mean time of intubation in the two groups**

| **MEAN TIME OF INTUBATION IN SEC.** | **KINGVISION I** | **TRUVIEW II** |
|---|---|---|
| | **MEAN ±SD** | **MEAN ±SD** |
| | 8.95±1.853 | 8.95 ±1.81 |
| **Statistical inference (Unpaired t test)** | 0.083 | |

As per table 3 The mean time of intubation was comparable between Kingvision and Truview group (8.95 VS 8.95 sec; p=0.083).

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

**Table 4- Comparison of groups according to mean heart rate (beats/minute)**

| HEART RATE TIME INTERVAL | KINGVISION I | TRUVIEW II | P VALUE |
|---|---|---|---|
| | MEAN ±SD | MEAN ±SD | |
| BEFORE INTUBATION | 86.50±15.38 | 83.25±11.55 | 0.545 |
| AFTER INTUBATION | 93.37±13.64 | 89.92±12.06 | 0.487 |
| AT 3 MINS | 87.45±13.84 | 86.92±11.06 | 0.942 |
| AT 5 MINS | 83.40±14.05 | 83.05±13.41 | 0.914 |
| AT 10 MINS | 82.42±14.09 | 81.60±12.63 | 0.938 |

As per table 4 In both groups mean heart rate increased immediately after intubation but thereafter dropped gradually to near normal till 10 minutes after intubation. The difference in both groups at different time intervals was statistically not significant.

**Table 5- Comparison of groups according to mean systolic blood pressure**

| SBP TIME INTERVAL | KINGVISION I | TRUVIEW II | P- VALUE |
|---|---|---|---|
| | MEAN ±SD | MEAN ±SD | |
| BEFORE INTUBATION | 128.75±18.43 | 126.35±17.03 | 0.707 |
| AFTER INTUBATION | 134.35±20.44 | 132.95±20.17 | 0.953 |
| AT 3 MINS | 122.35±20.12 | 122.38±18.93 | 0.825 |
| AT 5 MINS | 115.60±18.45 | 116.22±17.82 | 0.985 |
| AT 10 MINS | 114.35±16.27 | 117.62±14.22 | 0.415 |

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

As per table 5 the mean systolic blood pressure increased immediately after intubation in all both groups. Thereafter, it decreased gradually at different time intervals to near normal at 10 minutes after intubation. The difference in groups at different time intervals immediately after intubation was statistically not significant (p>0.05).

**Table 6- Comparison of groups according to mean diastolic blood Pressure(mmHg)**

| DBP TIME INTERVAL | KINGVISION I | TRUVIEW II | P VALUE |
|---|---|---|---|
| | MEAN ±SD | MEAN ±SD | |
| BEFORE INTUBATION | 79.32±15.01 | 79.90±13.19 | 0.780 |
| AFTER INTUBATION | 85.67±12.60 | 85.77±13.33 | 0.803 |
| AT 3 MINS | 81.01±12.19 | 79.72±13.38 | 0.896 |
| AT 5 MINS | 78.40±11.48 | 77.44±13.47 | 0.934 |
| AT 10 MINS | 77.25±10.90 | 78.07±11.47 | 0.521 |

As per table 6 the mean diastolic blood pressure increased immediately after intubation in both groups. Thereafter, it gradually dropped at different time intervals to near normal after 10 minutes of intubation. Statistically, the difference was not significant among the groups (p>0.05).

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

**Table 7- Comparison of groups according to mean blood oxygen saturation (%)**

| $SPO_2$ TIME INTERVAL | KINGVISION I | TRUVIEW II | P VALUE |
|---|---|---|---|
| | MEAN ±SD | MEAN ±SD | |
| BEFORE INTUBATION | 96.57±14.56 | 98.60±1.25 | 0.470 |
| AFTER INTUBATION | 98.82±0.812 | 99.20±0.882 | 0.293 |
| AT 3 MINS | 99.02±0.831 | 99.24±0.891 | 0.527 |
| AT 5 MINS | 98.95±0.814 | 99.15±0.89 | 0.523 |
| AT 10 MINS | 99.02±0.76 | 99.17±0.81 | 0.672 |

As per table 7 in all groups the mean blood oxygen saturation remained almost constant from before intubation to different time intervals after intubation. Statistically, the difference was not significant among the groups ($p>0.05$).\

**Discussion-**

Endotracheal intubation is the safest method to secure the airway and administer general anaesthesia. The most commonly used laryngoscope since its introduction is the Macintosh laryngoscope although over time various advances have been made resulting in development of laryngoscopes of different designs (Savoldelli GL et al., 2008; Levitan RM et al.,2011).[9,10] Video laryngoscopes have been recently developed and become popular as new tools to combat unanticipated difficult airway. These devices help to visualize the larynx without alignment of the oral, laryngeal and pharyngeal axes. In addition, these significantly reduce complications related to intubation. They combine the advantageous of fibre optic technology with the conventional laryngoscope making it effective in securing a difficult airway. Various types of video laryngoscopes have been developed till date. Two of which have been compared in the current study – Kingvision Video laryngoscope and Truview Video laryngoscope.

The present study was conducted to compare King vision video laryngoscope and Truview video laryngoscope in patients undergoing surgery with presumptive difficult

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

intubation with respect to the duration of intubation and the hemodynamic response. A total of 80 patients of either sex fulfilling inclusive criteria were randomly distributed in equal numbers to two intubation groups.

In this study there was no difference between the groups with regard to mean age, MPG grade, and physical status. Majority of the patients were in age group of 20-50 years in all the groups; Female predominance in the Kingvision group and Male predominance in the. In both group MPG class III patients predominated (65% in Kingvision and 62.5% in Truview). In the current study, mean time of intubation was comparable between Kingvision and Truview group (8.95 VS 8.95 sec; p=0.083).

Laurel D Murphy et al., (2014)[11] found that Time to intubation was faster with the KVVL in the difficult cadaver airway scenario as compared to direct laryngoscopy while Anto Sahaya et al., (2018)[12] reported that both Kings Vision and Truview Video-laryngoscopes provide comparable laryngoscopic view with similar patient comfort, although clinically Truview may be a better choice due to less time consumed for visualisation and rating vocal cord movement during extubation.

Few studies (Erdivanli et al., 2018; Kriege M et al., 2017)[13,14] found that intubation time was longer using Kingvision video laryngoscope as compared to Macintosh laryngoscope. The reason cited was although video laryngoscopes offer superior visualisation of the glottis; a good laryngeal view does not guarantee easy or successful tracheal tube insertion. This is because the laryngeal axes are not aligned in video laryngoscopy, and the tip of the tracheal tube must therefore pass around a relatively acute angle to enter the larynx.

In the present study, haemodynamic response to laryngoscopy and intubation with respect to mean heart rate, mean systolic blood pressure, mean diastolic blood pressure and mean blood saturation was similar. Although the hemodynamic parameters increased immediately after intubation and thereafter gradually decreased to near normal at 10 minutes after intubation still the differences between the both groups was not statistically significant ($p>0.05$). It has been seen that in most video laryngoscopes blades are angulated to enhance glottis visualisation. This makes the use of stylet important while using these laryngoscopes. Thus, leading to an increase hemodynamic response (Sachidananda R et al. 2016).[15]

Torun AC et al. (2011)[16] reported an increase in hemodynamic parameters after tracheal intubation from pre intubation value in Truview but they were comparable amongst the groups, which is similar to present study results.

The main limitation in our study is the anesthesiologist performing the intubation could not be blinded to the devices used in the study. Secondly, the experience of direct laryngoscopy ; in the anesthesiologist performing the laryngoscopy is more than video laryngoscopy.

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

**Conclusion-**

Although the duration of intubation was lesser in both the Kingvision and Truview video laryngoscope the difference was not statistically significant. Both the video laryngoscopes were found to be comparable in requirement of optimisation manoeuvres and need of second attempt for intubation. Hemodynamic response however was comparable in all the both laryngoscopes.

**Conflict of Interest**- None declared

**References-**

1. Akihisa Y, Maruyama K, Koyama, et al. Comparison of intubation performance between the King Vision and Macintosh laryngoscopes in novice personnel: a randomized, crossover manikin study. J Anesth 2014;28(1):51-7.

2. Ali QE, Amir SH, Jamil S, et al. A comparative evaluation of Kingvision video laryngoscope (channelled blade), McCoy and Macintosh laryngoscopes for tracheal intubation in patients with immobilized cervical spine. Sri Lankan Journal of Anaesthesiology,25(2),pp.70-75.

3. Caplan RA, Posner KL, Ward RJ, et al. The unanticipated difficult airway with the recommendations for management. Can J Anesth. 1998; 45:757-76.

4. Crosby ET, Cooper RM, Douglas MJ, et al. The unanticipated difficult airway with recommendations for management. Can J Anaesth 1998;45:757-76.

5. Bhola R, Bhalla S, Gupta R, et al. Tracheal intubation in patient with cervical spine immobilization: A comparison of McGrath video laryngoscope and Truview EVO2 laryngoscope. Indian J Anaesth 2014;58(3):269-74.

6. Bhattacharjee, Sulagna. A comparison between video laryngoscopy and direct laryngoscopy for endotracheal intubation in the emergency department: A meta-analysis of randomized controlled trials. Journal of Clinical Anaesthesia 2011, Volume 47, 21 – 26.

7. Aziz MF, Healy D, Kheterpal S, et al. Routine clinical practice effectiveness of the Glidescope in difficult airway management: an analysis of 2004 Glidescope in-tubations, complications, and failures from two institutions. Anesthesiology 2011;114 (1):34–41.

8. Cook T, Pandit J, Wilkes. A. Introduction and evaluation of new airway devices: current issues. TACC 2012; 2: 264–8.

9. Savoldelli GL, Schiffer E, Abegg C, et al. Comparison of the Glidescope, the McGrath MAC , AirTraq and Macintosh laryngoscopes in simulated difficult air-ways. Anaesthesia2008;63:1358-64.

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE 10, 2023

10. Levitan RM, Heitz JW, Sweeney M, et al. The complexities of tracheal intubation with direct laryngoscopy and intubation devices. Ann Emerg Med 2011;57:240-7.

11. Murphy LD, Kovacs GJ, Reardon PM, et al. Comparison of the King Vision video laryngoscope with the Macintosh laryngoscope. J Emerg Med 2014;47:239-46.

12. Sahay A, Dhanyee AS, Gautam AK. A Comparison of Kingvision videolaryngoscope with CMAC D-blade in obese patients with anticipated difficult airway in tertiary hospital in India-Randomised control study. J Anaesthesiol Clin Pharmacol 2019;35:363-7.

13. Erdivanli B, et al. Comparison of King vision video laryngoscope and Macintosh Laryngoscope: a prospective randomized controlled clinical trial. Brazialian Jour-nal of Anesthesiology (English edition).68.10.1016/j.bjane.2018.04.008.

14. Kriege M, Alfen C, Noppens RR. Using King vision video laryngoscope with a channelled blade prolongs time for tracheal intubation in different training levels, compared to non-channeled blade. PLOS ONE 2017;12(8):e0183382.

15. Sachinanda R, Umesh G, Shaikh SI. A review of haemodynamic response to the use of different types of laryngoscopes. Anaesth pain intensive care 2016;20(2);201-8.

16. Torun AC, Tur A, Ozkan F, et al. Assessment of Macintosh laryngoscope and Truview EVO2 video laryngoscope with respect to hemodynamic and intubation quality in patients with presumptive difficult intubation. J Exp Clin Med2011;23:4-7.