ISSN: 2581 – 3633
PubMed - National Library of Medicine - ID: 101745081

International Journal of Medical Science and Advanced Clinical Research (IJMACR)

Available Online at:www.ijmacr.com

Volume – 8, Issue – 4, July - 2025, Page No.: 193 – 206

Comparative Study of King Vision and Vl3r (Hugemed) TM Video Laryngoscope for the Ease of Intubation in Adult Patients Undergoing General Anaesthesia for Elective Surgery

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How to citation this article: Syed Kamran Habib, Qazi Ehsan Ali, Kshirsagar Trisha, Kumar Mukesh, "Comparative Study of King Vision and Vl3r (Hugemed) TM Video Laryngoscope for the Ease of Intubation in Adult Patients Undergoing General Anaesthesia for Elective Surgery", IJMACR- July - 2025, Volume – 8, Issue - 4, P. No. 193 – 206.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: It is challenging to intubate despite good visualization with hyperangulated blade of video laryngoscope. VL3 video laryngoscope with field angle 66° can save intubation time. We aim to evaluate performance of VL3 video laryngoscope in terms of intubation characteristics.

Subjects and Methods: Ours is a prospective observational study. After Institutional Ethics Committee approval, 35 patients were recruited for intubation using VL3 video laryngoscope and King Vision Video laryngoscope each for nonemergency surgery. The primary outcome was intubation time while ease of intubation in terms of Intubation Difficulty Scale, POGO score and hemodynamic responses and complications were noted as secondary outcomes. Inclusion criteria: Ages 18- 60 years, either sex, weight-45-70 kg, ASA I and II, all MPC grades. Exclusion criteria: past history of failed intubation, Ischaemic Heart Disease, Hypertension, raised ICP, spine /oral pathology, GE reflux.

Results: The mean intubation time was 24.742 seconds. 20 patients (57.142%) had a IDS of 0 (easy) .and 30 patients had a POGO score of 1- (85.714%). There were

0 cases of failed intubation even in three attempts. The variations in haemodynamic parameters were found to be statistically insignificant.

Discussion and Conclusion: Our mean intubation time was lesser than that of Toker MK2 et al with minimal haemodynamic variations .The VL3 video laryngoscope is an effective device for easy and quick intubation.

Keywords: Intubation time, VL3 video laryngoscope, POGO score

Introduction

An ideal laryngoscopy should provide adequate visualization of glottis to allow the correct placement of endotracheal tube with the minimum effort, less elapsed time and minimal potential for injury to the patient. The development of video and optical laryngoscopy in the last few decades could be the most important change in this paradigm.

Even with a clear glottic view on the monitor, inserting and advancing an endotracheal tube (ETT) can be difficult—particularly when using a video laryngoscope (VL) equipped with a hyperangulated blade.[1,2] The success of a Videolaryngoscope assisted intubation depends on multiple factors, such as blade design which could be acute angled or macintosh like; channelled or non-channelled; quality of the image on the monitor, as well as the experience of the intubator.[3,4]

Since the Video Laryngoscopes were introduced, the field of airway management has been revolutionized. Multiple studies have been conducted for comparing the efficiency of various Video laryngoscopes in terms of ease of intubation and reduction of intubation time. King vision is one of the devices that has been well studied and proven efficient in various difficult airway scenarios.[5,6] The VL3R (HugeMed)™[7] Video Laryngoscope is a comparatively newer device. Present study is aimed at comparing the VL3R (HugeMed)™ video laryngoscope and the Kingvision[8] video laryngoscope, in terms of airway management times, performance indices, hemodynamics and complications, if any, in adult patients scheduled for elective surgery.

Aim

To compare performance of VL3R (HugeMed)™ video laryngoscope and King Vision laryngoscope for ease of intubation in patients undergoing general anaesthesia for elective surgery in terms of following parameters:

Primary Objectives

- To compare the time for successful intubation.

Secondary Objectives

1. To compare the ease of intubation using both the devices based on Intubation Difficulty Scale and P.O.G.O. score.
2. To compare haemodynamic responses- In terms of Heart Rate, systolic blood pressure (S.B.P.), diastolic blood pressure (D.B.P.), mean arterial pressure (M.A.P.), SpO_2 at baseline at 1,3,5 and 10 minutes.
3. To look for complications (sore throat, blood on device, oro-dental trauma, oxygen desaturation).

Material and Methodology

Present study was single-center, Prospective, randomized study, conducted in department of Anaesthesiology, at Jawaharlal Nehru Medical college and Hospital, AMU, Aligarh, India. Study duration was of 2 years (April 2023 to March 2025). Study was approved by institutional ethical committee. This study has been registered with the CTRI and the CTRI number is CTRI/2024/02/062678

Inclusion criteria

- Patients age between 18-60 years,
- weight between 45-70 Kg,
- A.S.A. grade I-II of either sex

- undergoing elective surgery under general anaesthesia
- willing to participate in present study

Exclusion criteria

- A.S.A. grade III and IV
- Previous failed intubations
- Head and neck surgery
- Pregnancy
- Inter incisor distance less than 3 cm
- Risk of gastric regurgitation (full stomach, hiatus hernia)
- Raised ICP or cervical spine injury

All patients were assessed in pre-assessment clinic by either anaesthesia residents or experienced anaesthesiologists well before surgery. Careful history taking, general and systemic examinations as well as investigations was done to rule out any severe comorbidities. BMI calculations were done.

Patients were randomly allocated to one of two groups (n=35 for each group) by drawing sequentially numbered sealed opaque envelopes that contain a computer randomization code with 1:1 allocation ratio before general anaesthesia.

- **Group King Vision (Group K) (n=35)**: Intubation done using King Vision Videolaryngoscope
- **Group VL3R (Group V) (n=35)**: Intubation done using VL3R VideoLaryngoscope

The patient remained blinded about the laryngoscopic technique until the postoperative follow up. The study team and the anaesthesia team came to know about the choice of laryngoscope just prior to premedication. The required Video Laryngoscope, blade no 3, 4, adult malleable stylet and direct Laryngoscope was made available at the operating room where the study was conducted. An independent observer (not the anaesthetist on the case) noted the time for glottis visualization and intubation, along with hemodynamic response at various intervals.

Patients were advised to be nil by mouth 6 hours prior to surgery. Both Video Laryngoscopes were made available in the operation theatre. The sealed envelope was opened by the intubator just before the premedication. The investigator allotted laryngoscope to the intubator before premedication and took the role of recording the observations and data entry. Based on randomization, one of the two video laryngoscopes was used to intubate the trachea.

Anaesthetic plan was standardised between two groups and used for all patients prior to intubation. All Standard A.S.A. monitors were connected and basal heart rate, Systolic, Diastolic blood pressure and mean arterial pressure readings was recorded. The data was collected by a separate investigator.

Patients were premedicated with IV Inj. Ondansetron 0.1 mg/kg, IV Inj. Fentanyl 1.5 mcg/Kg and IV Inj. Midazolam 30mcg/Kg IV and preoxygenation was carried out using 100% oxygen using closed circuit with 10 liters of total gas flow. After premedication, Heart rate and Blood pressure was recorded as prior to intubation values. All patients were given IV Inj. Propofol 2 mg/kg for induction of anaesthesia until loss of consciousness. IV Inj Succinylcholine 1.5 mg/kg IV as intubating muscle relaxant was administered after loss of verbal contact and after demonstrable mask ventilation. Endotracheal intubation was done after disappearance of fasciculation using allotted laryngoscope. Following intubation, Patients were mechanically ventilated till the end of surgical procedure and anaesthesia was

maintained with 1-1.5 % Isoflurane, 60% nitrous oxide, and 40% oxygen.

Recording of Parameters

Intubation Time: The intubation time defined when the blade tip passed the incisors to the point until confirmation of the first wave of CO2 of the capnometer.

Base Line Monitoring: included heart rate, systolic, diastolic and mean blood pressure and Spo2 at 1,3,5 and 10 minutes after successful intubation. All the data was analyzed.

Intubation Difficulty Scale: Has 7 parameters which aims at assessing the ease of intubation – Number of intubation attempts, number of assistants required, number of different techniques used. Glottic exposure as explained by the Cormack grade minus one, lifting force given during laryngoscope, External laryngeal pressure , Vocal cords position during intubation.

Accordingly, the degree of difficulty is graded as 0 being the easy intubation, 1-5 being slightly difficult and >5 being difficult intubation.

POGO/Laryngeal View Score: By using the video laryngoscope, the grading of the laryngeal view was done as percentage of glottic opening visualized

Grade I-full view of the glottis/100%

Grade II- posterior commissure/Partial view-50%

Grade III - only epiglottis/none- 0%

In case of difficulty the patient would be intubated with the McCoy laryngoscope (rescue laryngoscope), with the help of a senior consultant. All the data was analyzed and seen to compare if one scope is better than the other. Air entry was confirmed by capnography and chest auscultation. If attempt of first intubation failed, next intubation was made only after 1 minute of mask ventilation. Failure of intubation was considered if it could not be done in 3 attempts. All patients underwent calculation for intubation difficulty scale, Cormack Lehane grading & laryngeal view score/ grade.

Data Analysis

Data were recorded and complied in Microsoft Excel spreadsheet and analysed using P.A.S.W. (Predictive Analysis Soft Ware) Statistics 18 (Statistical Package for Social Sciences S.P.S.S. Version 18.0) package. Descriptive statistics were elaborated as Mean and Standard deviation for continuous variables and frequency and percentage for categorical variables. Wherever appropriate, the data was presented in a graphical manner using bar graphs for categorical data and line graphs for continuous data. Comparison of continuous variables with normal distribution between 2 groups was carried out by Student's unpaired t-test and intra group was carried out by Student's paired t-test. Chi square test was applied to compare percentages between 2 groups. All statistical tests were two tailed. Alpha (α) Level of Significance was taken as $P<0.05$.

Observation and Results

Demographic Charecteristics

The age, gender, BMI & A.S.A. grade distribution among the two study groups, Group KingVision and Group VL3R (Group K and Group V respectively, each with 35 participants) was comparable.

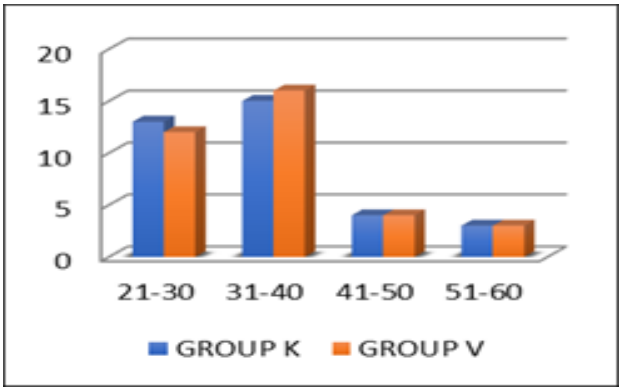

Figure 1: Comparison of age

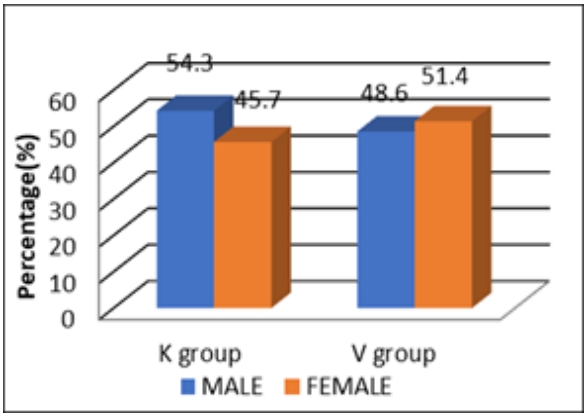

Figure 2: Comparison of gender

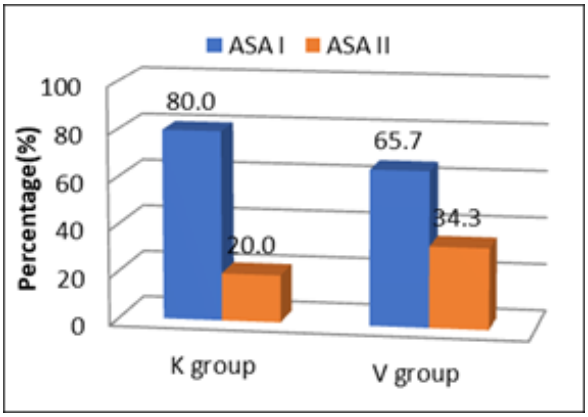

Figure 4: Comparison of ASA grades

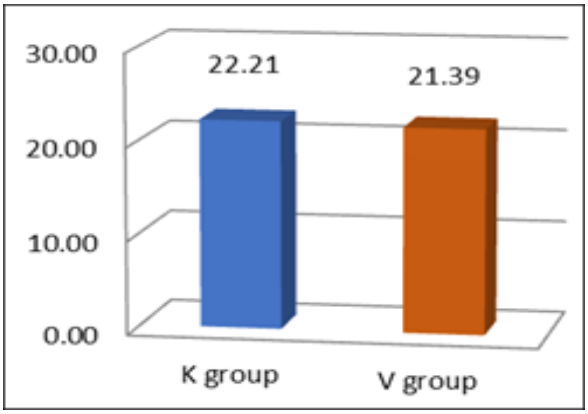

Figure 3: Mean BMI between two groups

Table 1: Demographic characteristics

Characteristics	Group KingVision	Group VL3RL3R	P values
Age group (in years)			
21-30	13 (37.14%)	12(34.29%)	P=0.8
31-40	15 (42.86 %)	16(45.71%)	
41-50	4(11.43%)	4(11.43%)	
51-60	3(8.57 %)	3 (8.57 %)	
81-90	4	0	
Gender			
Male	19(54.3%)	17(48.6%)	P=0.8
Female	16(45.7%)	18(51.4%)	
BMI			
<18.5	6(17.14%)	4(11.43 %)	P=0.2
18.6-24.9	21(60%)	26(74.28%)	
25-29.9	8(22.86%)	5(14.2%)	
A.S.A.			

I	28(80%)	23(65.7%)	P=0.3
II	7(20%)	12(34.3%)	

Performance Characteristics

Group KingVision had a mean intubation time of 31.46 ± 4.49 seconds, while Group VL3R had a mean intubation time of 24.74 ± 7.39 seconds. Statistical analysis revealed a t-value of 4.6, with a p-value of less than 0.001, indicating that the difference in mean intubation times between the two groups was statistically significant.

In Group KingVision (Group K), 10 out of 35 patients (28.57%) had an Intubation Difficulty Score (I.D.S.) of 0, and 25 patients (71.43%) had an I.D.S. ≥1. In contrast, Group VL3R (Group V) had 20 patients (57.1%) with an I.D.S. of 0 and 15 patients (42.9%) with an I.D.S. ≥1. The difference in distribution of I.D.S. scores between the groups was analyzed using the Chi-square test, yielding a statistically significant result (P = 0.03). This indicates that intubation was significantly easier in Group VL3R compared to Group KingVision.

In the VL3R group, majority of patients, 30 (85.7%) had a POGO score of 1, with a mean score of 1.23 ± 0.41, indicating adequate glottic view. Only 5(14.3%)of patients had POGO scores ≥2. In the KingVision group, 21 (60%) of patients had a POGO score of 1, a notable 14(40%) had scores of 2 or 3. The mean POGO score in the KingVision group was 1.54 ± 0.68, demonstrating a significantly higher P.O.G.O. score with p=0.03 (Chi square test) when compared with the VL3R group.

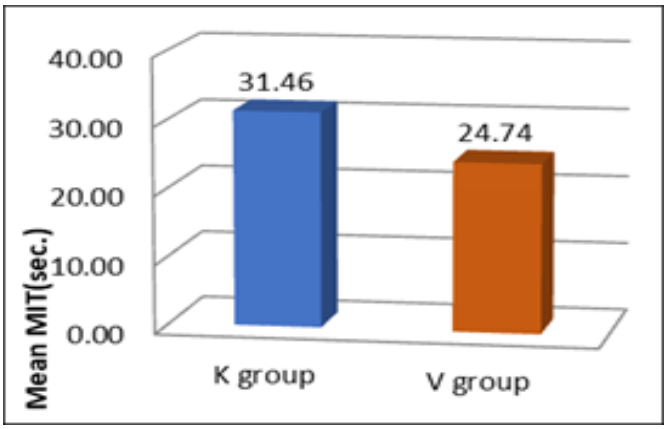

Figure 5: Comparison of Mean Intubation Time

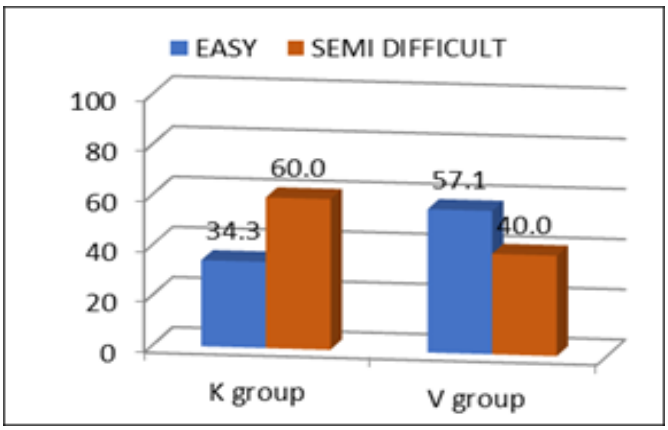

Figure 6: Comparison of ease of intubation

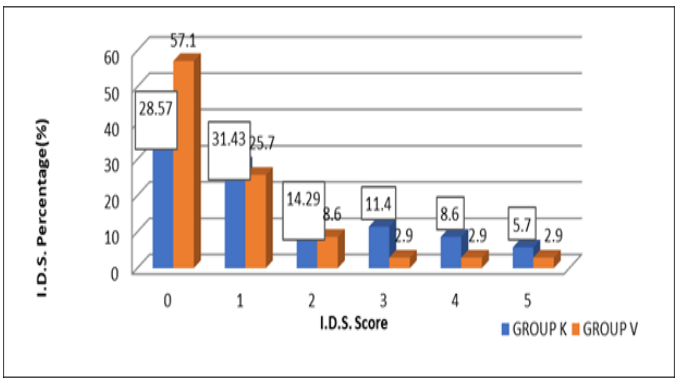

Figure 7: Comparison of IDS scores

Table 2: Comparison of measured variables among the study groups (N=70).

Characteristics	Group KingVision	Group VL3RL3R	P values
Mean Intubation time (MIT)	31.46 ± 4.49	24.74 ± 7.39	P<0.001
Intubation Difficulty Scale (I.D.S.)			
0 (Easy)	10(28.57%)	20(57.1%)	P=0.03
≥ 1(Semi Difficult)	25(71.43%)	15(42.9%)	
P.O.G.O Scores			
1	30(85.7%)	21(60%)	P=0.03
≥ 2	5(14.3%)	14(40%)	

In Group K, there was a significant reduction in HEART RATE at all post-induction time points when compared to T0 by using student's paired t-test. Specifically, heart rate decreased from 85.89 ± 2.68 bpm at T0 to 82.86 ± 4.22 bpm at T1 (Difference: 3.63 ± 3.28, t = 6.5, P < 0.001), 78.29 ± 4.23 bpm at T3 (Difference: 7.60 ± 5.57, t = 8.1, P < 0.001), 82.83 ± 2.24 bpm at T5 (Difference: 3.06 ± 2.53, t = 7.1, P < 0.001), and 82.09 ± 3.74 bpm at T10 (Difference: 3.80 ± 3.25, t = 6.9, P < 0.001). These results, analyzed using the paired Student's t-test, indicated that the decrease in heart rate was statistically significant at all-time points.

For S.B.P., in Group K, a significant rise was observed at T5 (122.74 ± 11.61 mmHg) and T10 (121.63 ± 10.49 mmHg) compared to baseline (115.09 ± 10.52 mmHg), with t = 7.1, P < 0.001 and t = 6.9, P < 0.001, respectively. For D.B.P., Group K showed significant changes at T3 (69.91 ± 3.47 mmHg, t = 2.5, P = 0.02), T5 (57.91 ± 9.90 mmHg, t = 3.5, P = 0.001) and T10 (60.71 ± 9.82 mmHg, t = 2.6, P = 0.02) compared to T0 (65.57 ± 8.47 mmHg). For M.A.P., Group KingVision had significant differences at T3 (84.29 ± 2.67 mmHg, t = 2.5, P = 0.02) and T5 (79.46 ± 4.49 mmHg, t = 2.5, P = 0.02) compared to T0 (82.06 ± 4.04 mmHg).

In Group KingVision, the mean SpO_2 at T0 was 99.71 ± 0.57%. Across all subsequent time points, no significant changes were observed: T1 (99.86 ± 0.43%, t = 0.6, P = 0.5), T3 (99.91 ± 0.28%, t = 0.5, P = 0.6), T5 (99.86 ± 0.43%, t = 0.6, P = 0.5), and T10 (99.91 ± 0.28%, t = 0.5, P = 0.6).

Table 3: Comparison of Haemodynamic parameters among Group KingVision

TIME (min)	Pre-induction (T0)	Immediate Post insertion (T1)	Diff.T0-T1	T value, Significance & P value
mean heart rate				
T0-T1	85.89 ± 2.68	82.86 ± 4.22	3.63 ± 3.28	t=6.5,S,P<0.001
T0-T3	85.89 ± 2.68	78.29 ± 4.23	7.60 ± 5.57	t=8.1,S,P<0.001
T0-T5	85.89 ± 2.68	82.83 ± 2.24	3.06 ± 2.53	t=7.1,S,P<0.001
T0-T10	85.89 ± 2.68	82.09 ± 3.74	3.80 ± 3.25	t=6.9,S,P<0.001
Systolic Blood				

Pressure				
T0-T1	115.09 ± 10.52	118.29± 9.13	3.20 ± 13.41	t=1.2,NS,P=0.2
T0-T3	115.09 ± 10.52	112.74 ± 9.09	2.43 ±5.57	t=0.7,NS,P=0.5
T0-T5	115.09 ± 10.52	122.74 ± 11.61	7.66 ±18.75	t=7.1,S,P<0.001
T0-T10	115.09 ± 10.52	121.63 ± 10.49	6.54± 10.93	t=6.9, S,P<0..001
Diastolic Blood Pressure				
T0-T1	65.57 ± 8.47	64.57 ± 6.55	1.00 ± 12.26	t=0.5,NS,P=0.6
T0-T3	65.57 ± 8.47	69.91 ± 3.47	4.34 ± 10.12	t=2.5,S,P=0.02
T0-T5	65.57 ± 8.47	57.91 ± 9.90	7.66 ± 12.88	t=3.5,S,P=0.001
T0-T10	65.57 ± 8.47	60.71 ± 9.82	4.86 ± 11.23	t=2.6,S,P=0.02
Mean Arterial Pressure				
T0-T1	82.06 ± 4.04	82.54± 3.44	0.48 ± 8.36	t=0.5,NS,P=0.6
T0-T3	82.06 ± 4.04	84.29 ± 2.67	2.23 ± 5.16	t=2.5,S,P=0.02
T0-T5	82.06 ± 4.04	79.46 ± 4.49	2.60 ±6.05	t=2.5,S,P=0.02
T0-T10	82.06 ± 4.04	80.97 ± 4.99	1.09 ± 5.97	t=1.1,NS,P=0.3
SpO_2				
T0-T1	99.71± 0.57	99.86 ± 0.43	0.15 ± 0.69	t=0.6,NS,P=0.5
T0-T3	99.71± 0.57	99.91 ± 0.28	0.20 ± 0.63	t=0.5,NS,P=0.6
T0-T5	99.71± 0.57	99.86 ±0.43	0.15 ± 0.69	t=0.6,NS,P=0.5
T0-T10	99.71± 0.57	99.91 ± 0.28	0.20 ± 0.63	t=0.5,NS,P=0.6

Group V showed no statistically significant changes in heart rate at any time point, with values at T1 (85.89 ± 10.50 bpm), T3 (85.69 ± 4.19 bpm), T5 (86.40 ± 4.24 bpm), and T10 (85.69 ± 4.19 bpm) remaining relatively stable and without significant differences from T0. The Student‘s paired t-test revealed non-significant results in Group VL3R ($P > 0.05$ for all comparisons).

In Group V, significant differences were noted in SBP at T1 (124.00 ± 13.30 mmHg, t = 2.4, P = 0.021), T5 (123.23 ± 9.82 mmHg, t = 2.3, P = 0.03) and T10 (121.40 ± 8.55 mmHg, t = 3.0, P = 0.005). In Group V, significant increases in DBP were seen at T5 (73.43 ± 7.64 mmHg, t = 3.4, P = 0.002) and T10 (75.26 ± 8.10 mmHg, t = 4.9, $P < 0.001$) from the baseline of 68.74 ± 10.01 mmHg. Group VL3R showed no statistically significant changes in M.A.P. at any time point (T1 to T10), with all $P > 0.05$.

In Group VL3R, the baseline SpO_2 was 98.77 ± 0.81%, and values remained statistically unchanged at all measured intervals: T1 (99.89 ± 0.83%, t = 0.6, P = 0.5), T3 (98.74 ± 0.89%, t = 0.5, P = 0.6), T5 (98.71 ± 0.83%, t = 0.3, P = 0.7), and T10 (98.71 ± 1.05%, t = 0.2, P = 0.8).

Table 4: Comparison of Haemodynamic parameters among group VL3R

TIME (min)	Pre-induction (T0)	Immediate Post insertion (T1)	Diff.T0-T1	T value, Significance & P value
mean heart rate				
T0-T1	84.29 ± 11.01	85.89 ± 10.50	1.60 ± 7.83	t=1.2,NS,P=0.2
T0-T3	84.29 ± 11.01	85.69 ± 4.19	1.40 ± 11.98	t=0.7,NS,P=0.5
T0-T5	84.29 ± 11.01	86.40 ± 4.24	2.11 ± 10.24	t=1.2,NS,P=0.2
T0-T10	84.29 ± 11.01	85.69 ± 4.19	1.40 ± 11.98	t=0.7,NS,P=0.5
Systolic Blood Pressure				
T0-T1	125.91 ± 13.30	124.00± 13.30	1.91 ± 4.69	t=2.4, S,P=0.021
T0-T3	125.91 ± 13.30	124.06 ± 10.57	1.86 ± 6.31	t=1.7,NS,P=0.09
T0-T5	125.91 ± 13.30	123.23 ± 9.82	2.69 ± 6.99	t=2.3,S,P=0.03
T0-T10	125.91 ± 13.30	121.40 ± 8.55	4.51± 8.93	t=3.0, S,P=0.005
Diastolic Blood Pressure				
T0-T1	68.74 ± 10.01	70.57 ± 8.76	1.83 ± 5.47	t=2.0,NS,P=0.06
T0-T3	68.74 ± 10.01	70.43 ± 6.97	1.69 ± 6.87	t=1.5,NS,P=0.2
T0-T5	68.74 ± 10.01	73.43 ± 7.64	4.69 ± 8.18	t=3.4,S,P=0.002
T0-T10	68.74 ± 10.01	75.26 ± 8.10	6.52 ± 7.84	t=4.9,S,P<0.001
Mean Arterial Pressure				
T0-T1	87.83± 8.09	88.51 ± 7.38	0.68 ± 4.01	t=1.0,NS,P=0.3
T0-T3	87.83± 8.09	88.26 ± 5.50	0.43 ± 5.22	t=0.5,NS,P=0.6
T0-T5	87.83± 8.09	89.83 ± 5.65	2.00 ± 6.31	t=1.9,NS,P=0.07
T0-T10	87.83± 8.09	89.97 ± 5.03	2.14 ± 6.55	t=1.9,NS,P=0.07
SpO2				
T0-T1	98.77 ± 0.81	99.89± 0.83	0.15 ± 1.00	t=0.6,NS,P=0.5
T0-T3	98.77 ± 0.81	98.74 ± 0.89	0.03± 0.86	t=0.5,NS,P=0.6
T0-T5	98.77 ± 0.81	98.71 ± 0.83	0.06 ± 1.02	t=0.3,NS,P=0.7
T0-T10	98.77 ± 0.81	98.71 ± 1.05	0.06 ± 1.02	t=0.2,NS,P=0.8

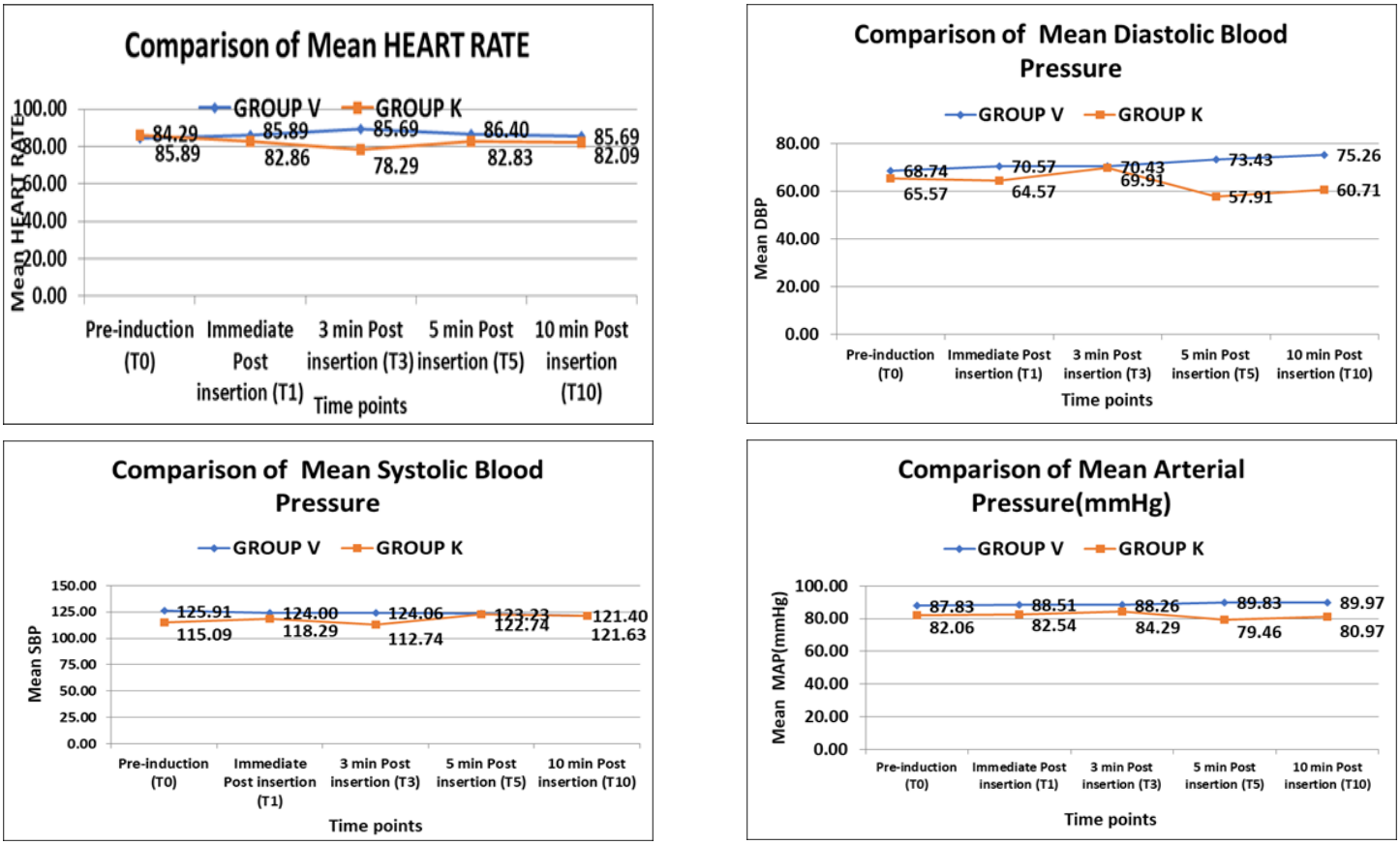

Figure 8: Comparison of Haemodynamic Parameters

In Group KingVision, 31 out of 35 patients (88.57%) had no complications, while 4 patients (11.43%) experienced a sore throat. In Group VL3R, 33 out of 35 patients (94.29%) had no complications, and 2 patients (5.71%) reported a sore throat. Although the frequency of sore throat was slightly higher in Group KingVision than in Group VL3R, the difference was not statistically significant as p value was 0.393153 (P > 0.05, Chi-square test), indicating that the incidence of this complication was comparable between the two groups.

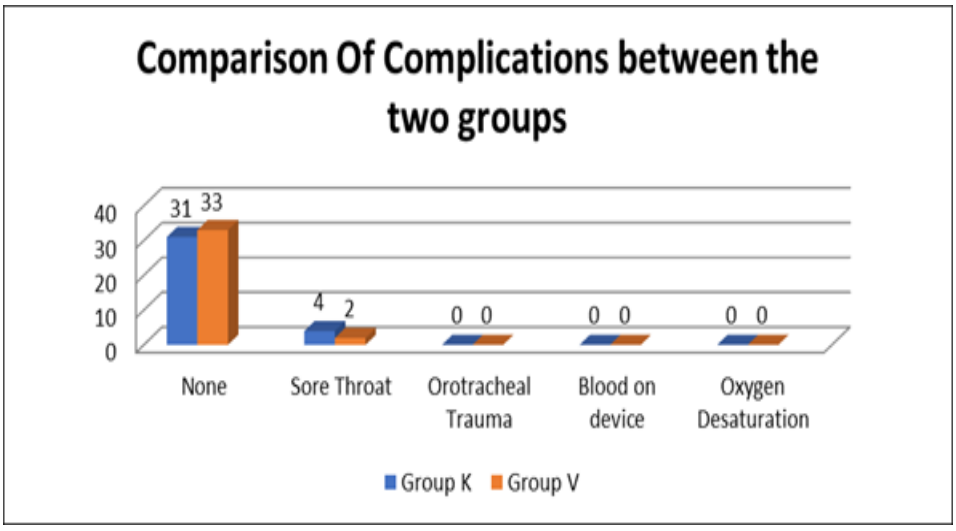

Figure 9: Comparison of complications

Table 5: Comparison of complications between the groups

Complications	None	Sore throat	Oro-tracheal trauma	Blood on device	Oxygen desaturation
Group KingVision	31(88.57%)	4(11.43%)	0	0	0
Group VL3R	33(94.29%)	2(5.71%)	0	0	0

Discussion

A prospective, randomized comparative study titled "A Comparative Study of King Vision and VL3R (HugeMed™) Video Laryngoscope for the ease of intubation in adult patients undergoing general anaesthesia for elective surgery was conducted. Patients included in this study were comparable with respect to age, sex, weight, height, BMI and A.S.A. grades. Hence demographic data has no influence on the outcome of the study. Normal distribution was observed in the entire demographic data.

The mean intubation time in Group KingVision was 31.46 ± 4.49 seconds, whereas in Group VL3R it was 24.74 ± 7.39 seconds. This difference was statistically significant ($p < 0.001$). Notably, there were no cases of failed intubation in either group. These findings suggest that the VL3 device may offer improved visualization of the larynx and vocal cords.

This is similar to the study by Indrani Appikonda et al.,[9] where VL3R took lesser time for intubation (21.7 seconds) vs the McCoy laryngoscope which took 27.8 seconds to intubate. In contrast, Elhadi et al.,[10] reported no significant difference in intubation times between the King Vision and Macintosh laryngoscopes which was 19.1 in Macintosh Group and 17.31 in KingVision Group.

Longer intubation times with the King Vision laryngoscope in our study may be attributed to the non-channelled blade, though equipped with a slot for mounting the endotracheal tube, has a relatively thick profile, potentially complicating insertion, especially in patients with limited oral cavity space. The indirect glottic view provided by the King Vision—via a camera located at the distal blade tip—may offer an advantage over the direct line-of-sight method used in the Macintosh, as suggested by Gómez-Ríos et al.,[11] who found better visualization with Airtraq and McGrath devices. Similarly, Elhadi et al.,[10] observed improved glottic views with the King Vision.

In our study, the Intubation Difficulty Score (IDS) was used to assess ease of intubation across two groups. Overall, while the KingVision group had more cases falling into the semi-difficult category (25/35, 71.43%), the VL3R group had a higher proportion of easy intubations (20/35, 57.1%). Thus there is an advantage in using video laryngoscopes as they provide enhanced glottic visualization compared to conventional laryngoscopes. The channelled blade design, as seen in both devices, particularly aids intubation by facilitating guided tube insertion.

In studies by Jain et al.,[12] they compared McCoy laryngoscope and C-MAC video laryngoscope in simulated cervical spine injury and observed that out of 30 patients, 29 patients in C-MAC group and 16 patients in McCoy group had CL grade 1 and was statistically significant. Sabry et al.,[13] compared C-MAC D blade and McCoy laryngoscopes during cervical immobilization and observed that out of 30 patients, 16 patients in C-MAC group and 4 patients in

McCoy group had CL grade 1 and was statistically significant.

The King Vision video laryngoscope, with its screen mounted on the handle, is longer and bulkier than the VL3R, making oral insertion more challenging. Its thicker blade and increased length often led to difficulty during laryngoscopy, especially due to interference from the anterior chest. Additionally, glottic visualization and tracheal intubation with King Vision more frequently required external laryngeal manipulation compared to the VL3R. Regarding the number of intubation attempts in our study, there was no significant difference.

In our study 34 or 97.1 % patients in VL3R Group VL3R and 33 or 94.3 % patients in KingVision Group KingVision was intubated in first attempt and were comparable. The results were similar to the study by Jain et al.,[12] It has been found that video-laryngoscopes yield better glottic visualization, higher success rate for difficult airways, and faster learning curve, resulting in higher success rates for intubations by novice physicians. Our study had non channelled prototypes Difficulty in airway management has been associated with serious complications, especially when intubation fails.

The present study shows that the use of the VL3R video laryngoscope provides comparable or better glottis view than KingVision laryngoscopy. In patients with impeded glottic view (C/L≥2a), C/L class may be improved and subsequently patients may be intubated with the VL3R which is a relatively new device with the unique advantage that it provides the possibility to obtain both a direct laryngoscopic view and a camera view that is displayed on the video screen, in contrast to many previous video laryngoscopes.

On the one hand, this may be very helpful for educational purposes, since the student is enabled to follow an ideal intubation process on the video screen, and thereafter, the instructor may directly observe the student‘s intubation attempts. On the other hand, this may have important ramifications, if the video view is worse than the direct view.

Sore throat was the only complication observed in both groups, occurring in 4 patients (11.4%) in the KingVision group and 2 patients (5.7%) in the VL3R group. This difference was not statistically significant ($p > 0.05$). The sore throat was effectively managed with saline nebulization and dexamethasone at a dose of 0.2 mg/kg. No other complications such as airway trauma, dental injury, or bleeding were reported in either group.

Supporting these findings, Q.E. Ali et al.,[14] and Siddharta Hanjura et al.,[15] reported that the King Vision video laryngoscope (KVVL) is associated with fewer complications and reduced airway trauma compared to conventional laryngoscopy. Specifically, Ali et al.,[14] noted a sore throat incidence of 9% with KVVL versus 18% with Macintosh laryngoscopy. Maharaj CH et al.,[16] also observed significantly less airway trauma with KVVL, including lower rates of mucosal injury (5% vs 15%) and dental trauma (2% vs 8%) compared to Macintosh laryngoscope.

Further reinforcing these observations, James W. Ibiuson et al.,[17] concluded that video laryngoscopes generally present a lower complication rate compared to direct laryngoscopy. Their systematic review reported an overall sore throat incidence of 10% with video laryngoscopes versus 20% with direct laryngoscopes, alongside reduced incidences of mucosal injury and dental trauma. Overall, the reduced complications

associated with videolaryngoscopy, particularly KVVL and VL3R, highlight their safety profile and advantage in minimizing airway trauma during intubation.

Limitations of present study were, potential for bias exists as it is very difficult to blind the operator to the video laryngoscope. The ease of intubation, as provided by the I.D.S., is a subjective scale. The I.D.S. was mainly constituted for direct laryngoscopy, its efficacy in indirect laryngoscopy is less clear. Limitations of this study include the need for further research comparing various prototypes of video laryngoscope blades.

Conclusion

Mean Intubation time using VL3R Video laryngoscope was 24.74±7.39 seconds which was significantly lesser than the mean intubation time using KingVision Video laryngoscope which was 31.46±4.49 seconds. Ease of intubation was more with the VL3R Video laryngoscope. More stable hemodynamic parameters were achieved with the use of VL3R. Both the Video laryngoscpes were comparable in terms of the complications associated with the usage of this device.

On the basis of our study the VL3R Video laryngoscope as assessed in terms of clinical efficacy has come up as equivalent to currently available standard video laryngoscopes such as KingsVision Video laryngoscope. Further larger controlled trials may further elucidate these findings.

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