Section: Anaesthesia

Original Research Article

COMPARISON OF MCCOY LARYNGOSCOPE WITH KING VISION VIDEO LARYNGOSCOPE USING CHANNELLED BLADE AS INTUBATING DEVICE FOR OROTRACHEAL INTUBATION IN ADULT PATIENTS

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ABSTRACT

Background: The present Randomised comparative study was conducted in the Department of Anesthesiology at tertiary care hospital, after Institutional review Board approval on 60 adult patients posted for elective surgical surgeries under General Anesthesia, with ASA grade I and II, in age group of 18-60 years, having EGRI < 7. The patients were randomly divided into two groups: Group MCCOY- Patients intubated using Mccoy Laryngoscope. Group KVC - Patients intubated using King Vision Video Laryngoscope Channelled blade. Two groups were evaluated using the following parameters: Time for glottic view, time for insertion of Endotracheal tube, total time, number of attempts, optimization maneuvers, Cormarck Lehane score, ease of insertion, intubation difficulty score, hemodynamic changes, & Complications.

Materials and Methods:

Results: Both groups were comparable with respect to demographics. Other results obtained in the study: Time for glottic view &Time for tracheal tube insertion, Total time number of attempts, Cormarck Lehane score, POGO score,ease of insertion, Intubation Difficulty score were comparable in both groups. Optimisation Manoeuvres In GROUP KVC, Out of 30 patients, no patients required use of stylet/ bougie for intubation and 5 patients (16.67%) required other manoeuvres for successful intubation. In GROUP MCCOY, Out of 30 patients, 8 patients (26.67%) required use of stylet/ bougie for intubation and 8 patients (26.67%) required other manoeuvres for successful intubation.(P= 0.044). Hemodynamic Changes Heart Rate, Systolic BP, Diastolic BP, Mean BP. They were significantly increased in GROUP MCCOY just after intubation and 1 min post intubation compared to Group KVC. ($p < 0.05$) complications: in our study 3 patients of KVC group and 4 patients of MCCOY group had sore throat 2hours after extubation.

Conclusion: kingvision Videolaryngoscope is better than Maccoy laryngoscope for orotracheal intubation in patients with prediction of difficult intubation

Keywords: Endotracheal intubation, Channelled blade, Mccoy blade, Kingvision video laryngoscope.

INTRODUCTION

Endotracheal intubation is Gold standard for General anaesthesia.

Direct laryngoscopy and passage of endotracheal tube through larynx is a noxious stimuli which can provoke untoward response in cardiovascular, respiratory and other physiological systems. Failed or difficult intubation is associated with complications, including increased risk of hypertension, desaturation, unexpected admissions to ICU and death.

Conventional direct laryngoscopy with MacIntosh laryngoscope requires alignment of oral, pharyngeal

and laryngeal axis which necessitates putting patient in sniffing position to achieve flexion of lower cervical spine and extension at atlanto occipital joint. This can be difficult to achieve in patients with limited neck movement. Untoward sympathetic response arises mainly due to stimulation of the supraglottic region by tissue tension induced by laryngoscope.[1]

Mccoy laryngoscope is designed to elevate the epiglottis with its hinged tip. This design has two advantages compared with the Macintosh laryngoscope; less force is applied during laryngoscopy and stress response to laryngoscopy is reduced, and difficult laryngeal visualisation may be improved by lifting the epiglottis, especially in patients with fixed necks in neutral position.[1]

Videolaryngoscopes have characteristics of both rigid laryngoscopes and fiberoptic bronchoscopes. Since their introduction they have transformed to manage difficult airway.

Most of the difficult airway guidelines have laid stress on the role of videolaryngoscope in the management of both anticipated and unanticipated airways.

Success of video laryngoscope assisted intubation depends on multiple factors such as blade design (acute angled or Mac Intosh like; channelled or non-channelled); quality of the image on the monitor, as well as the experience of the intubator.

King vision laryngoscope is the most recent and portable airway device. It consists of a 2.4 inch reusable display and disposable blade. There are 2 types of blade

1. Channelled blade: That permits passage of tracheal tube
2. Non-channelled blade: Just allows visualisation of glottis

While videolaryngoscope may aid in better visualisation of larynx, evidence are required to establish that use of videolaryngoscope reduces number of intubation attempts, time of intubation in non difficult airway, incidence of hypoxia or respiratory complications.[2]

EGRI is used to predict difficult intubation since 2011 and tested with various laryngoscopes as well as videolaryngoscopes.

Hence we decided to compare efficacy of orotracheal intubation by Mccoy laryngoscope and King Vision video laryngoscope (channelled blade) in patients with EGRI <7 for elective general surgical procedures in terms of intubation ease, time and success of first attempt, Glottic view, Haemodynamic response to laryngoscopy and intubation.

Aims and Objectives

Aims: To compare efficacy of orotracheal intubation by Mccoy laryngoscope and King Vision video laryngoscope (channelled blade) in patients with EGRI <7 for elective general surgical procedures in terms of intubation ease, time and success of first attempt, haemodynamic stability.

Objectives:

A. Primary outcomes:

Intubation time, Time to best view of glottis,
Success rate of 1st attempt intubation, Number of intubation attempts

B. Secondary outcomes:

Optimisation manoeuvres or bougie/stylet if required, Ease of insertion using 5 point Likert scale, Intubation Difficulty Score (IDS) – assessment of difficulty in intubation, Cormack-Lehanne and POGO score, Haemodynamic parameters at baseline, post induction, just after intubation and at 1, 3 and 5,10 minutes after intubation noted.

Complications such as airway trauma, esophageal intubation, desaturation, injury to teeth noted. Sore throat and hoarseness at 2 hours and 24 hours will be noted.

MATERIALS AND METHODS

Study type: Randomised prospective observational comparative study

Study duration: 2022-2024.

Sixty patients of ASA physical status I and II undergoing elective surgeries under general anaesthesia requiring orotracheal intubation were included in the study. Patients in the age group of 18-60 years were included in the study. The study was conducted in our tertiary care hospital. The study was approved by our institutional ethical committee, Narendra Modi Medical College & LG hospital, Ahmedabad, Gujarat.. After obtaining informed written consent from the patients, the study was conducted.

Sample size calculation: For sample size calculation we have done pilot study. Time taken for intubation was 24.0+/-7.5 sec in McCoy laryngoscope, whereas in KVL channelled blade it was 13.8+/-8.0 sec, with mean difference of 10.2 sec, standardized effect was 1.40. Assuming alpha error of 0.05, power of 95, sample size arrived per group was 27. We add 10%of dropouts, thereby final sample size was 30 per group, & total 60 patients.

Inclusion criteria:

- Patient aged 18 – 60 years.
- ASA grade I and II.
- Either gender, Male/ Female.
- Elective surgeries.
- EGRI (El- Ganzouri) index: A multivariate risk index based on 7

parameters for predicted difficult intubation. Patient will be enrolled if

Exclusion criteria:

- Patient refusal
- EGRI score > 7
- Potential risk of regurgitation
- Impairment of Temporomandibular joint
- BMI >35
- Severe obstructive sleep apnoea
- Glottic or supraglottic mass

Methodology: All patients underwent a thorough pre anaesthetic check up that includes history taking, general and systemic examination.

Prediction of difficult intubation was done by EGRI (El-Ganzouri) index. EGRI index is a multivariate risk index based on 7 parameters that includes:

Routine investigations like hemogram, blood sugar, serum electrolytes, RFT, LFT, Xray PA view, ECG and PT/INR.

A written and informed consent was taken. Patient was randomly assigned to either group by odd and even random number that were concealed in sequentially numbered opaque envelopes.

Execution of randomisation was done at the time of induction.

All patients were kept Nil By Mouth overnight before surgery. After taking patients in operation theatre basic monitoring was established that includes non-invasive BP, pulse-oximetry, 5 electrode ECG, capnography. Vitals were noted.

An IV cannula was placed and preloading done with 10ml/kg IV fluid. All patients were uniformly premedicated with intravenous injection Ondansetron 0.05mg/kg, injection Glycopyrrolate 0.004mg/kg, injection Midazolam 0.025 mg/kg and injection Fentanyl 2ug/kg. All patients were pre-oxygenated by a facemask with 100% oxygen for 3 minutes.

Induction was done with intravenous injection Propofol 2mg/kg and neuromuscular blockade was achieved by using Succinylcholine 1.5mg/kg after checking adequacy of bag mask ventilation.

Laryngoscopy was done after 1 minute of succinylcholine administration and full relaxation by experienced anaesthetist (experience of 30 intubation of each Mccoy laryngoscope and King vision channelled video laryngoscope.)

In the group of King vision video laryngoscope channelled, appropriate sized cuffed endotracheal tube was preloaded before intubation.

Endotracheal tube placement was confirmed by direct visualisation of tube passage beyond vocal cords and capnographic trace was considered as confirmation of intubation.

Intubation procedure was stopped if saturation dropped <95% or unexpected technical problems were encountered. Mask ventilation was employed with 100% oxygen. Repeat attempts were made only after ensuring adequate oxygenation, relaxation and ensuring proper functioning of device used in each group. If the endotracheal tube was not placed at an ideal depth within three attempts, the operator was allowed to use a different device for intubation. It was considered a failure if a device change was needed. Failed intubation was managed according to ASA guidelines for Airway Management.

Requirements of stylet bougie and other manoeuvres for intubation were noted. Other manoeuvres include use of external laryngeal pressure, BURP, lifting force required, Scope manipulations needed for intubations -towards left, towards right, withdrawal of scope, lifting of scope and Endotracheal tube manipulations needed for intubation - Anticlockwise rotation of tube, withdrawal and readjustment towards left and External manipulation.

Haemodynamic parameters noticed periodically to see stress response in both groups.

Anaesthesia was maintained with nitrous oxide in oxygen (50:50) with sevoflurane and atracurium infusion in appropriate doses. Antagonism of residual neuromuscular blockade was done at the end of surgery using injection neostigmine 50 µg/kg and injection glycopyrrolate 10 µg/kg IV. Following extubation, the endotracheal tube was inspected for blood staining in order to evaluate trauma that could have occurred during intubation.

RESULTS

[Table 1] shows demographic and patient characteristics of GROUP KVC and GROUP MCCOY that are statistically non-significant (p> 0.05). Hence both groups are comparable.

Table 1: demographic data and patient characteristics

Variable	Group KVC	Group MCCOY	P value	Inference
Age(yrs)	37±12.67	33.83±11.60	0.467	NS
BMI(kg/m2)	22.64±2.94	23.33±3.40	0.225	NS
ASA (I/II)	16/14	19/11		
modified mallampati class-1/2/3/4	0/26/4/0	0/27/3/0		
Mouth opening(cm)	4.04±0.36	4.17±0.36	0.168	NS
thyromental distance (cm)	6.74±0.34	6.64±0.418	0.532	NS
El Ganzouri index(mean+/-SD)	1.67+-1.15	1.83+-1.39	0.312	NS
EGRI<4	27	25		
EGRI>=4 – predictor of diff. Intubation	3	5		
Sex				
Male/female	10/20	16/14		

Table 2: time to intubation and glottic view

Time (seconds)	Group KVC (n=30)	Group MCCOY(n=30)	P Value	Inference
Glottic view time	9.43±2.46	8.57±2.70	0.157	NS
Tracheal tube insertion time	14.40±6.47	14.50±7.04	0.945	NS
Total Time	23.83±8.50	23.07±8.59	0.670	NS

It is evident from [Table 2] that difference in glottic view time, tracheal tube insertion time and total time in GROUP KVC and GROUP MCCOY was statistically non-significant (p value > 0.05)

Number of Attempts: In Group KVC, Out of 30 patients, 24 patients (80%) were intubated in single attempt, 6 patients (20%) were intubated in two attempts and no patient needed third attempt.
In Group MCCOY, Out of 30 patients, 23 patients (76.67%) were intubated in single attempt, 6 patients (20%) were intubated in two attempts and 1 patient (3.33%) was intubated in three attempts.
No patient in any group has failed intubation in our study. (P = 0.600). (NS)

Optimisation Maneuvers: In Group KVC, Out of 30 patients, no patients required use of stylet/ bougie for intubation and 5 patients (16.67%) required other maneuvers for successful intubation.
In GROUP MCCOY, Out of 30 patients, 8 patients (26.67%) required use of stylet/ bougie for intubation and 8 patients (26.67%) required other manoeuvres for successful intubation. (P= 0.044,S).

Cormack Lehanne Grade: In Group KVC, Out of 30 patients, CL grade 1 was present in 26 patients (86.67%), grade 2a was present in 2 patients (6.67%) and grade 2b was present in 2 patients (6.67%).
In GROUP MCCOY, Out of 30 patients, CL grade 1 was present in 23 patients (76.67%), grade 2a was present in 4 patients (13.34%), grade 2b was present in 2 patients (6.67%) and grade 3 was present in 1 patient (3.34%). P = 0.604 (NS)

Pogo Score: In Group KVC, 100% POGO Score was present in 26 patients (86.67%) and 50-100% POGO score was present in 4 patients (13.34%).
In Group MCCOY, 100% POGO Score was present in 23 patients (76.67%) and 50-100% POGO score was present in 7 patients (23.34%). (P = 0.6059) (NS)
No patient in any group encountered failure to intubation.

Ease Of Insertion (5 Point Likert Scale)
In Group KVC, 16 patients (53.33%) had very easy ease of insertion, 7 patients (23.33%) had easy ease of insertion, 3 patients (10%) had normal ease of insertion, 3 patients (10%) had difficult ease of insertion and 1 patient (3.33%) had very difficult ease of insertion.
In Group MCCOY, 14 patients (46.66%) had very easy ease of insertion, 5 patients (16.66%) had easy ease of insertion, 3 patients(10%) had normal ease of insertion, 5 patients (16.66%) had difficult ease of insertion and 3 patients (10%) had very difficult ease of insertion.(P = 0.741)

IDS (Intubation Difficulty Score)
In Group KVC, Out of 30 patients, 16 patients (53.33%) had IDS score 0, 14 patients (46.66%) had IDS score between 0-5.
In Group MCCOY, Out of 30 patients, 16 patients (53.33%) had IDS score 0, 14 patients (46.66%) had IDS score between 0-5. No patient in both gr has IDS more than 5. (P = 1)

Table 3: heart rate

	Group KVC (n=30)	Group MC COY(n=30)	P Value	Inference
Baseline	79.73±7.94	83.20±9.39	0.072	NS
Post induction	78.87±8.64	80.80±8.53	0.258	NS
Just after intubation	84.60±7.56	100.47±8.80	0.0001	HS
1 min	77.33±8.52	88.53±10.14	0.0013	S
3 min	75.27±6.65	75.33±6.42	0.962	NS
5 min	75.53±6.96	76±6.87	0.671	NS
10 min	73.87±4.61	75±7.04	0.355	NS

Heart rate was significantly increased in GROUP MCCOY just after intubation and 1 min post intubation compared to GROUP KVC. ($p < 0.05$)

Table 4: systolic BP

	Group KVC (n=30)	Group MC COY(n=30)	P Value	Inference
Baseline	126.27±8.35	124.00±8.68	0.221	NS
Post induction	116.80±9.15	114.40±5.81	0.131	NS
Just after intubation	126.47±8.11	141.10±7.59	0.0001	HS
1 min	123±6.70	126.47±7.96	0.186	NS
3 min	120±6.79	121.13±7.06	0.669	NS
5 min	118.67±5.10	120.13±5.94	0.408	NS
10 min	117.67±4.20	118.47±5.11	0.599	NS

Systolic BP had highly significant increase in GROUP MCCOY just after intubation compared to GROUP KVC ($p < 0.05$).

Table 5: Diastolic BP

	Group KVC (n=30)	Group MC COY(n=30)	P Value	Inference
Baseline	79.13±5.75	77.67±6.06	0.409	NS
Post induction	74.07±6.16	70.47±6.36	0.035	S
Just after intubation	84.07±5.81	94.27±5.35	0.0001	HS
1 min	77.53±6.74	78.87±7.42	0.597	NS
3 min	75.27±6.00	76.60±5.80	0.355	NS
5 min	73.80±4.62	76.33±5.04	0.070	NS
10 min	70.13±3.86	71.67±2.93	0.057	NS

Diastolic BP was significantly increased in GROUP MCCOY just post induction and highly significant increase just after intubation compared to GROUP KVC ($p < 0.05$).

Complications:

- Group KVC- 3 patients had sore throat (2hrs after extubation)
- Group MCCOY-4 patients had sore throat (2hrs after extubation)
- No other complications were seen.
- Esophageal intubation was not encountered in either of the groups.

DISCUSSION

In present study we have used King vision video laryngoscope with channelled blade and Mccoy laryngoscope for orotracheal intubation in adult patient with having EGRI 1-7 (Predictors of difficult intubation).

D caldiroli et al,[8] developed and tested a new algorithm for managing difficult airways, combining the El Ganzouri Risk Index (EGRI) with the GlideScope® videolaryngoscope. Algorithm was based on el ganzouri index resulted in successful tracheal intubation, with effective management of difficult laryngeal exposure, ventilation, and intubation failures.

Suk-hwan seo et al,[9] used total airway score to assess difficult airway.

Hiteshi aggrawal et al,[17] have compared mcintosh, mccoy and cmac videolaryngoscope and concluded that mccoy laryngoscope provides better attenuation of hemodynamic response to intubation in compared to mcintosh and videolaryngoscope.

Zia arshad et al,[10] have concluded that mccoy blade is better than macintosh blade in difficult airway cases, it provides improve laryngeal view in patients with limited neck extension.

Jitendra yadav et al,[23] QE ali et al,[12] Sarfaraz ahmad et al,[13] Pasupunuri et al,[19] on different clinical conditions have studied comparison of Mccoy blade and Kingvision videolaryngoscope for orotracheal intubation.

Pasupunuri et al,[19] QE ali et al,[12] and Jitendra yadav et al,[23] aims to find out the better option between King vision video laryngoscope and Mccoy blade laryngoscope in patients with immobilized cervical spine.

Demographic data: The demographic variables and patient characteristics were similar in both the groups. There was no statistics. There are more females patients compared to male in our study. Predictor of difficult intubation- El ganzouri index parameters like body weight, mouth opening, thyromental distance were comparable in both groups. EGRI score was comparable in both groups. Five patients in GROUP KVC had BMI more than 25 and 7 patients in GROUP MCCOY had BMI more than 25.

Khwaja nasir et al,[7] have discussed correlation of mallampati classification and cormack lehane grading in their study on ASA 1,2 and 3 grade, concluded that MP grading is good predictor for tracheal intubation.

In our study all patient in each group had ELGI <7 so they were premedicated, induced and paralyzed. D. Caldiroli et al, had used same algorithm for patients with difficult intubation predictors(ELGI <7).

Time For Tracheal Tube Insertion: [Table 2]

In our study, the difference in glottic view time, tracheal tube insertion time and total time in GROUP KVC and GROUP MCCOY was statistically non-significant & Comparable. (p value > 0.05).

Median duration of time to intubate was 23 sec in both groups.

Pasupunuri et al,[19] in their study showed the mean intubation time was significantly shorter with King vision (16.9± 3.5 sec) compared to Mccoy (19.3±5.1 sec) (p=0.021).

The result of Jitendra et al,[23] suggested that group KVC required significantly less time for intubation (16.57+- 4.11 sec) than patients in group mccoy (20.14+-5.72 sec) (p value 0.004). Their experience was better with KVC as angulations of channelled blade was better and easy hand to eye coordination.

In QE ali et al,[12] study there was no statistically significant differences in the time required for successful intubation (P=0.082). Time for intubation was comparable between KVC and McCoy.

In Sarfaraz ahmad et al,[13] study the time taken for intubation was less with the King vision video laryngoscope (13.9±3.16 Sec.) than with the Mc Coy laryngoscope (16.33±4.57 Sec); however, this difference was found to be statistically insignificant. The prolonged time of intubation with the Mc Coy laryngoscope was because the field of vision was narrower and smaller, requiring more time to identify the pharyngeal and laryngeal structures to direct the tracheal tube to the glottis opening.

In Amit shah et al,[24] study, confirmation of intubation was by capnographic tracing and direct visualisation of tube beyond vocal cords.

Number of attempts: In our study, GROUP KVC, Out of 30 patients, 24 patients (80%) were intubated in single attempt, 6 patients (20%) were intubated in two attempts and no patient needed third attempt.

In GROUP MCCOY, Out of 30 patients, 23 patients (76.67%) were intubated in single attempt, 6 patients (20%) were intubated in two attempts and 1 patient (3.33%) was intubated in three attempts. (P= 0.600) (NS).

In study conducted by Sarfaraz ahmed et al,[13] 93% of the patients were intubated in single attempt with King Vision video laryngoscope as compared to 82% with Mc Coy laryngoscope. However, 7% patients with King Vision and 18% with Mc Coy required second attempts for intubation. Among the two instruments none had taken more than two attempts for successful intubation. (p=0.0106). In KVC group

more numbers of patients were intubated in first attempts as compared to MCC group.

Jitendrakumar yadav et al,[23] study shows that successful intubation was 100.0% in both the groups and no statistically significant difference existed between the patients in either group in terms of the number of successful attempts.

Pasupunuri et al,[19] in their study showed that 29 patients proceed in 1st attempt and 1 in 2nd attempt in Group KVC out of 30 patients and 28 patients proceed in 1st attempt and 2 in 2nd attempt in Group Mccoy out of 30 patients. (p=0.553).

Optimisation Maneuver: In our study, In GROUP KVC, Out of 30 patients, no patients required use of stylet/ bougie for intubation and 5 patients (16.67%) required other maneuvers for successful intubation.

In GROUP MCCOY, Out of 30 patients, 8 patients (26.67%) required use of stylet/ bougie for intubation and 8 patients (26.67%) required other maneuvers for successful intubation. P= 0.044 (S).Need for optimisation maneuver in GROUP MCCOY is significantly more than GROUP KVC.

In study of Pasupunuri et al,[19] No other maneuvers and use of stylet were required to improve the success of intubation in either of the groups.

n a study by Amitkumar dey et al,[20] showed that Optimisation maneuver was required in 50% of the group Mccoy patients as compared to 10% of group KVC was statistically significant (p<0.001). Hence group mccoy needs more optimisation maneuvers compared to group KVC to obtain proper glottic view.

Cormack lehanne grade: In our study, In GROUP KVC, Out of 30 patients, CL grade 1 was present in 26 patients (86.67%), grade 2a was present in 2 patients (6.67%) and grade 2b was present in 2 patients (6.67%).

In GROUP MCCOY, Out of 30 patients, CL grade 1 was present in 23 patients (76.67%), grade 2a was present in 4 patients (13.34%), grade 2b was present in 2 patients (6.67%) and grade 3 was present in 1 patient (3.34%). (P = 0.604) (NS)

In study conducted by QE ali et al,[12] McCoy laryngoscope has been reported as improving the Cormack — Lehane laryngoscopic view by at least one grade in 45.1% of patients wearing a rigid cervical collar, and in 49% of patients whose neck was stabilized with manual in-line stabilization but found to be less superior than the King Vision video laryngoscope.

Limitation of study conducted by Sarfaraz ahmed et al,[13] was that they did not study the Cormack-Lehane(C&L) grading and percentage of glottic opening (POGO) scores.

Study by Amitkumar dey et al,[20] showed that group KVC patients were graded 1 as per Cormack and Lehane view in 76% cases with no grade 3 and 4 occurrence as compared to group Mccoy, which was statistically highly significant (p=0.002).

Study by Ajay kumar et al,[21] observed 2 patients in KVC group have CL grade 2a out of total 70 patients.

POGO SCORE

Our study shows, In GROUP KVC, 100% POGO Score was present in 26 patients (86.67%) and 50-100% POGO score was present in 4 patients (13.34%). In GROUP MCCOY, 100% POGO Score was present in 23 patients (76.67%) and 50-100% POGO score was present in 7 patients (23.34%). P =0.6059.

In study of Richard levitan et al,[6] they have concluded that if POGO score is more than 50% than higher success rate for intubation in comparison to lower POGO scores. In our study we have no failure to intubation in any group.

In study by Jitendra yadav et al,[23] Group KVC, 16 patients have 100% POGO scores, 14 have 50-100%, and 5 have scores below 50%, while in Group MCCOY, 9 patients have 100% POGO scores, 9 have 50100% and 17 have scores below 50%. Thus, patients in Group KVC demonstrate significantly better glottic visualization in terms of POGO scores with “p-=0.008”

Limitation of study conducted by Sarfaraz ahmed et al,[13] was that they did not study the Cormack-Lehane(C&L) grading and percentage of glottic opening (POGO) scores.

In study by Pasupunuri et al,[19] 14 patients have 100% POGO score, 13 have 50-100% and 3 have < 50% POGO score in Group KVC and 8 patients have 100% POGO score, 8 have 50-100% and 14 have < 50% POGO score in Group MCCOY. There was a statistically significant difference in POGO score of patients in between Group KVC and Group MCCOY (p<0.001)

Ease of Insertion: In GROUP KVC, 16 patients (53.33%) had very easy ease of insertion, 7 patients (23.33%) had easy ease of insertion, 3 patients (10%) had normal ease of insertion, 3 patients (10%) had difficult ease of insertion and 1 patient (3.33%) had very difficult ease of insertion.

In GROUP MCCOY, 14 patients (46.66%) had very easy ease of insertion, 5 patients (16.66%) had easy ease of insertion, 3 patients (10%) had normal ease of insertion, 5 patients (16.66%) had difficult ease of insertion and 3 patients (10%) had very difficult ease of insertion. (P = 0.741)

Study by QE ali et al,[12] incorporated the intubation difficulty score for the assessment of ease of intubation that incorporates multiple indices of intubation difficulty and objectively quantifies the complexity of tracheal intubations.

In study by Sarfaraz ahmed et al,[13] Grading of ease of intubation was done - Grade I: When No extrinsic manipulation of the larynx required, Grade II: When External manipulation of the larynx is required, Grade III: Failed intubation.

The incidence of ease of intubation grade 1 with King vision video laryngoscope was 93% and with McCoy laryngoscope was 87%. However; 7% with King vision, 13% with Mc Coy had grade 2 ease of intubation P= 0.3354.

Intubation Difficulty Score: In GROUP KVC, Out of 30 patients, 16 patients (53.33%) had IDS score 0, 14 patients (46.66%) had IDS score between 0-5.

In GROUP MCCOY, Out of 30 patients, 16 patients (53.33%) had IDS score 0, 14 patients (46.66%) had IDS score between 0-5.P value is 1(NS).

In study by Pasupunuri et al,[19] in Group KVC, 14 patients have 0 IDS 0,11 have < 5 IDS score and 5 have > 5 IDS and out 30 patients in Group MCCOY, 9 patients have 0 ID, 8 have < 5 IDS and 13 have > 5IDS. There was no statistically significant difference in IDS of patients in between both groups (p=0.077).

Study by Jitendra yadav et al,[23] In group KVC 17 patients with 0 IDS, 12 patients with 1-5 IDS scores, and 6 patients with > 5 IDS, whereas Group MCCOY has 10 patients with 0 IDS, 9 patients with 1-5 IDS, and 16 patients with > 5 IDS. Thus, we encountered significantly more difficulty in intubation in group MCCOY (p=0.034).

Sukh hwan seo et al,[9] IDS score less than or equal to 5 have no failure of intubation. In our study we had no failures to intubation as all the patients in both the groups have IDS less than or equal to 5.

Hemodynamic Changes [Table 3-5]

In our study, Heart rate was significantly increased in GROUP MCCOY just after intubation and 1 min post intubation compared to GROUP KVC. ($p < 0.05$)

Systolic BP had highly significant increase in GROUP MCCOY just after intubation compared to GROUP KVC ($p < 0.05$).

Diastolic BP was significantly increased in GROUP MCCOY just post induction and highly significant increase just after intubation compared to GROUP KVC ($p < 0.05$).

Mean BP was significantly increased in GROUP MCCOY just post induction and highly significant increase just after intubation compared to GROUP KVC ($p < 0.05$).

In study by Jitendra Yadav et al,[23] there was no statistically difference in terms of mean pulse rate, mean systolic blood pressure, mean diastolic blood pressure and mean arterial pressure in the intraoperative and postoperative period at different time intervals. Comparable hemodynamic parameters reflect the fact that both McCoy and King vision both provides a glottis view without a need to align the oral, pharyngeal and laryngeal axes and therefore require less force to be applied during laryngoscopy.

In study by Sarfaraz ahmed et al,[13] there was a significant rise in heart rate from pre intubation value to 1, 3 and 5 minute of post intubation but came down near to preintubation value within 10 minutes of intubation.

The post intubation rise in mean arterial blood pressure was also significantly less in KVL group as compared to MCC group.

The haemodynamic stress response to laryngoscopy and intubation was found to be less with KVL group as compared to MCC group, since using king vision video laryngoscope; there is no need to adjust the head and neck position & minimum manipulation of laryngeal structure were required. The detachable nature of king vision monitor and blade make it very easy to introduce the blade without the need of any movement at cervical vertebrae. Mouth opening required for the channelled blade is only about two centimetres due to which the blade could be easily introduced inside mouth of patients by applying only jaw thrust.

In study by Pasupunuri et al,[19] The mean arterial pressure was better in Group KVC although, there was no statistically significant difference. Hemodynamic response during intubation in cervical immobilized patients has least effect in Group KVC as compared to Group MCCOY.

In study by Amitkumar dey et al,[20] There were significant ($p<0.01$) changes in pulse rate, systolic BP and diastolic BP in group Mccoy as compared to group KVC at 5min after intubation owing to the greater mean duration of intubation.

Complications: In our study 3 patients of KVC group and 4 patients of MCCOY group had sore throat 2hours after extubation. Amit kumar dey et al,[20] observed tooth brokage and airway laceration in mccoy group. This difference may be due to simulation of cervical spine immobilization in their study

In study by Sarfaraz ahmad et al,[13] sore throat was in 1 out of 30 patients in KVC group and 4 out of 30 in MCCOY group. They have also observed blood staining in 2 patients in KVC and 3 patients in MCCOY group.

Like QE ali et al,[12] study, we donot have any complication of esophageal tntubation.

Limitations:

1. Present study deals with a small subset of patients from a single center
2. Levels of catecholamines like adrenaline, noradrenaline regulating the haemodynamic status and its variability with procedures like laryngoscopy was not assessed during this study.
3. Intra cuff tracheal pressure monitoring was not available during study period.
4. The anaesthetist was not blinded to the randomization of laryngoscope, which could have resulted in observer's bias if anaesthetist already had a personal preference for a particular device
5. All intubation were carried out by experienced anaesthesiologists hence the results may not apply to less experienced person.

CONCLUSION

In conclusion, both Kingvision videolaryngoscope (channelled blade) and Mccoy laryngoscope provided comparable successful intubation in terms of time to intubation, time to best glottic view, ease of intubation, intubation difficulty score, cormack lehanne score and POGO score, whereas success at first attempt was more in KVL group and number of attempts, optimisation manuever requirement and

hemodynamic changes were more with Mccoy laryngoscope group.

In nutshell Kingvision videolaryngoscope (channelled blade) is more advantageous than Mccoy laryngoscope for orotracheal intubation in adult patients.

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