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Original Research Paper

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COMPARATIVE EVALUTION OF VIDEO LARYNGOSCOPY AND CONVENTIONAL LARYNGOSCOPY GUIDED INTUBATION IN MODIFIED MALLAMPATI GRADE II PATIENTS UNDERGOING ELECTIVE SURGERY UNDER GENERAL ANESTHESIA

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ABSTRACT

Aims- To evaluate the safety and efficacy of Video laryngoscope against conventional laryngoscope for intubation in MMPG II patients undergoing elective surgery under general anaesthesia. **Materials And Methods-** After ethical committee approval and written informed consent 60 adult patients posted for elective surgeries with airway assessment categorized as MMPGII were taken up for study and divided in two study groups. Standardized anaesthesia technique was used. For both the groups IDS score, time of intubation, hemodynamic parameters and degree of neck movement were recorded. **Observations-** Video laryngoscope shows same overall IDS score and same grading of IDS as Conventional laryngoscope. Duration of intubation is significantly less with Conventional laryngoscope as compared to Video laryngoscope. **Conclusion-** Intubation with Conventional Laryngoscope is equally safe but easier and faster than Video Laryngoscope in MMPGII patients.

KEYWORDS : Laryngoscope, MMPGII, Intubation.

AIM AND OBJECTIVES

- To evaluate the safety and efficacy of Video laryngoscope against conventional laryngoscope for intubation in Modified Mallampati grade 2 patients undergoing elective surgery under general anaesthesia.
- Primary objective- to compare intubation difficulty scale (IDS) score between both the groups of patients.
- The Secondary objectives are –
- To compare the time taken for intubation.
- To compare Hemodynamic Parameters before and after intubation.

MATERIAL AND METHODS

Study population— After institutional ethical committee approval and written informed consent 60 adult patients from both the sexes, of ASA grade I and II, between the age of 18 to 60; posted for elective surgeries with airway assessment categorized as MMPGII were taken up for study.

Sample Size and Sample Technique- 60 patients were taken and were allocated in the two groups using random number table. For both the groups intubation was done in the ideal situation required for the intubation for that particular device. In both the groups premedication was done with Inj Glycopyrollate (0.02 mg/kg) and Inj Fentanyl (2 mcg/kg) iv 5 minutes before procedure. In the operation theater after proper positioning, induction was done by Inj. Propofol (2mg/kg body weight) and muscle relaxation was achieved by Cisatracurium Besylate (0.15 mg/kg). Tracheal intubation was done after 3 mins of bag and mask ventilation after Inj Cisatracurium Besylate.

- **Group C-** intubated by using Conventional Laryngoscope.
- **Group V-** intubated by using Vedio Laryngoscope.

Successful intubation was confirmed by chest auscultation and end-tidal CO2 graph. For both the groups IDS score, time of intubation, hemodynamic parameters and degree of neck movement were recorded.

Statistical Analysis

Data was presented in terms of frequency and percentage for qualitative (categorical) variable and for quantitative variables, data was presented in terms of range (min, max), mean, SD. Median (Inter quartile range) in case data do not follow a normal distribution for both the groups separately. [1,3]

The Quantitative variables like Degree of neck movement, Time, BP, HR were calculated by *Student t Test* and *Mann Whitney Test* while Qualitative variables like IDS score was by *Chi-square* and *Fischer Exact Test*. [2,3]

ANOVA with repeated measures will be applied to see overall significance (inter and intra) for quantitative variables and the level of significance will be taken as $p \leq 0.05$ and the data will be analyzed by using SPSS statistical software version 20.

Observations And Results:

Our two study groups were comparable on baseline characteristics age, weight, gender and ASA physical status. Both the groups had patients with MMPGII and were similar with respect to mouth opening and upper lip bite test.

Intubation Difficuty Scale (ids) Score

The mean IDS in C group were 0.15 and SD was 0.45. While in V group mean was 0.45 and SD 0.60. p value - 0.112 which implies no difference between the two groups regarding IDS score.

Table : ***IDS score classification among groups***

IDS Score	C	V	Total
0	23	22	45
1	4	5	9
2	3	3	6
Total	30	30	60

p-value = 0.1

Intubation difficulty score = sum of all the seven parameters.

Table : ***Grading of IDS score among groups***

Group	C	V	Total	p-value
Easy (IDS=0)	23	22	45	0.144
Moderate (IDS=1-5)	5	10	15	0.144
Difficult (IDS>5)	0	0	0	NA

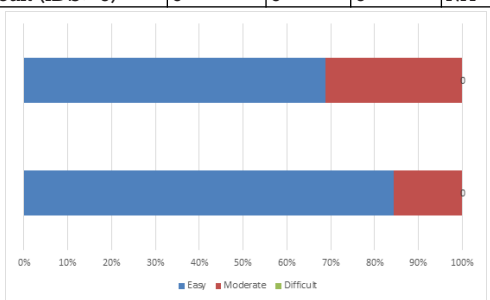

Figure : Bar diagram showing IDS score difficulty level among study groups

Individual Parameter Of The Intubation Difficulty Scale (ids)

Number Of Additional Intubation Attempts

p value is 0.003, which indicates the difference in intubation attempts in the two groups is highly significant statistically 27 patients of group C and 24 patients of group V were intubated in the first attempt. 3 patient in group C and 6 patients in group V required more than 1 attempt.

Number of additional operator – N2

All the patients in both C and V group were intubated by the first operator. So there is no any significant difference between the two groups regarding number of additional operators.

Number of alternative techniques used- N3 p value was 0.053 statistically significant.

Glottic Exposure (Cormack – Lehane grade) – N4

All the patients in both the groups had good glottis view during intubation with both the intubating devices. None of the patients in both the groups had Cormack Lehane Grade more than 1.

Subjective measure of lifting force – N5

In both the groups no any patient required any lifting force during intubation.

Necessity of applied external Laryngeal Pressure for Optimizing the Glottis Exposure – N6

External laryngeal pressure was required in only 8 patients during intubation with conventional laryngoscope. But external laryngeal force was required in 3 patients of Group V during intubation with video laryngoscope. p value 0.05.

Position of Vocal Cords N7

In all patients vocal cords were abducted. Therefore, it shows no significant difference between the two groups in terms of position of vocal cords during intubation.

Duration Of Intubation

Mean duration of intubation in group C was 10.59 seconds with SD of 1.17 where as in group V it was 23.47 seconds with SD 8.02. p value was <0.001 which shows the difference is highly significant statistically.

Table : ***comparison of duration of intubation between groups***

Variable	Group	MeanSD	P-value
Time of intubation (in sec)	C	10.591.17	<0.001
	V	23.478.02	

Hemodynamic Changes

Hemodynamic instability was seen more with Video laryngoscope than conventional laryngoscope. In both the groups HR increased significantly at 1st and 3rd min of intubation and return to normal at 5th min after intubation. But comparing the increase in HR between both the devices for 1st min we found that the difference was significant and conventional laryngoscope showed better results than Video laryngoscope. In both the groups significant increase in the MAP was noted at 1st min of intubation. In group C, MAP came to pre intubation level at 2nd min of intubation, while in group V MAP came to pre intubation level at 3rd min of intubation. On statistical analysis, we found no significant difference between the two groups.

DISCUSSION

Airway management is of prime importance in administration of general anaesthesia. Conventional direct laryngscopy has been used since times immemorial for endotracheal intubation[1,3]. Video laryngoscope offers an advantage of better glottis view in reduced mouth opening patients or patients with restricted cervical spine movement. Video laryngoscope though a newer modality requires far less expertise and can be used for training purpose[5].

In our study mean time required for intubation with conventional laryngoscope was 10.59 sec while for Video laryngoscope was 23.47 sec. Considering heart rate and BP fluctuations Conventional laryngoscope showed better results than Video laryngoscope. The haemodynamic fluctuations seem to be directly related to the time required for intubation. The ease and acceptance of conventional laryngoscope was far more for the operators compared to video laryngoscope. And hence the operators were more comfortable and had more hands on experience with conventional laryngoscope as compared to video laryngoscope which happens to be a relatively newer technology.

Modric and Martinez et al. [2,3] on their study on 200 subjects with reduced mouth opening and difficult airway observed that the rate of successful intubation in first attempt and without use of a second operator or alternative technique or external laryngeal pressure was significantly more with video laryngoscope as compared to conventional laryngoscope. The time required for intubation was more with video laryngoscope and so was the haemodynamic instability associated with it. The results of this study were consensus with our study and study done by Carlos and Casseti et al.[1,4]

Paqueta et al[5] in a similar study done on 50 subjects with less than 2 finger breath mouth opening concluded that better glottis visibility and CL grading was observed with use of video laryngoscope than with conventional laryngoscope.

Maldini et al[2,3] in their study on traumatic cervical spine injury patients observed that with application of manual inline stabilization neck movement associated with intubation was significantly less with video laryngoscope as compared to conventional laryngoscope.

RESULTS

Intubation difficulty scale (IDS) score, Hemodynamic parameters, duration of intubation and neck movement were compared among the two groups C and V.

1. There was no difference between the two groups in regards to overall IDS score and grading of IDS score. This indicates that intubation with Video laryngoscope is as easy as Conventional laryngoscope. But when we compared individual parameters of IDS score we found that video laryngoscope stands better than conventional laryngoscope. In respect to requirement of additional attempts for intubation, requirement of alternate technique for intubation and requirement of external laryngeal pressure during intubation; video laryngoscope stands better than conventional laryngoscope.. For rest of the parameters of IDS score both the intubating devices showed equal results.

2. Regarding the time required for intubation, video laryngoscope showed better results than video laryngoscope stands better than conventional laryngoscope. Mean time required for intubation with conventional laryngoscope was 10.59 sec while for Video laryngoscope was 23.47 sec.

3. Hemodynamic instability was seen more with Video laryngoscope than conventional laryngoscope. In both the groups HR increased significantly at 1st and 3rd min of intubation and return to normal at 5th min after intubation. But comparing the increase in HR between both the devices for 1st min we found that the difference was significant and

conventional laryngoscope showed better results than Video laryngoscope.

4. In both the groups significant increase in the MAP was noted at 1st min of intubation. In group C, MAP came to pre intubation level at 2nd min of intubation, while in group V MAP came to pre intubation level at 3rd min of intubation. On statistical analysis, we found no significant difference between the two groups.

CONCLUSION

1. Video laryngoscope shows same overall IDS score and same grading of IDS as Conventional laryngoscope. Though during comparison with individual parameters of IDS score Video laryngoscope showed better outcome in view of number of additional attempts and requirement of alternate technique for intubation.

2. Hemodynamic pressure responses are not significantly different in Video laryngoscope and Conventional laryngoscope.

3. Duration of intubation is significantly less with Conventional laryngoscope as compared to Video laryngoscope.

4. There is no any significant difference regarding degree of neck movement between both the groups.

Limitations

1. Our study was done on a small number of cases (30 patients in each group). Larger sample sizes are required to be studied over a longer period of time to validate our results and extrapolate the results to the whole population.

2. Our study excludes patients with only MMPGII patients so extremely difficult and extremely easy intubation scenarios are excluded. Our study excluded patients with anatomically difficult airways, patients with mouth opening <3cm, MPG grade ≥3/4. So this limits the extrapolation of the results to those categories of patients. Hence, true utility of a video laryngoscope cannot be commented on.

3. Our study excludes patients with ASA grade 3 and 4 patients, patients of age below 18 yr and above 60 yr, so this limits the extrapolation of the results to those category of patients.

4. The study was conducted only in the operation theater and on the patients who were well prepared for surgery, so the results cannot be extrapolated to the general population and the patients in emergency scenarios.

REFERENCES

1. Akhtar M, Ali Z, Hassan N, Mehdi S, Wani GM, Mir AH.A Randomized Study Comparing the Sniffing Position with Simple Head Extension for Glottis Visualization and Difficulty in Intubation during Direct Laryngoscopy.Anesth Essays Res. 2017 Jul-Sep;11(3):762-766. doi: 10.4103/0259-1162.204206.
2. Bellhouse CP, Doré C. Criteria for estimating likelihood of difficulty of endotracheal intubation with the Macintosh laryngoscope. Anaesth Intensive Care. 1988 Aug;16(3):329.
3. Benumof JL. Management of the difficult adult airway. Anesthesiology 1991;75:1087-110 , PMID: 1824555
4. Caplan RA, Posner KL, Ward RJ, Cheney FW.Adverse respiratory events in anesthesia: a closed claims analysis.Anesthesiology. 1990 May;72(5):828-33.PMID: 2339799
5. Tiret L, Desmonts JM, Hatton F, Vourc'h G.Complications associated with anaesthesia--a prospective survey in France.Can Anaesth Soc J. 1986 May;33(3 Pt 1):336-44.