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COMPARISON BETWEEN MACINTOSH AND LEVERING (MCCOY'S TYPE) LARYNGOSCOPE BLADE TO STUDY STRESS RESPONSE AND EASE OF INTUBATION."

Anesthesiology

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ABSTRACT

INTRODUCTION:- The aim of laryngoscopy is to obtain good visualisation of vocal cords to facilitate smooth endotracheal intubation. Both laryngoscopy and intubation trigger major stress responses which can be catastropic in patients with ischaemic heart disease or hypertension. This study was undertaken with the aim to compare the hemodynamic responses, glottic view and intubating conditions using McCoy's blade versus MacIntosh blade for intubation.

MATERIALS AND METHODS:- A Prospective, Comparative, Single blind, Randomized Study was undertaken in Krishna Institute of Medical Sciences, Hospital and Research Centre, Karad, after obtaining ethical committee clearance as well as informed written consent from all patients. The study was carried from December 2016 to july 2018. 130 patients recruited for the study are randomly allocated into 2 groups i.e. into Group A and Group B of 65 patients each undergoing laryngoscopy with MacIntosh blade and McCoy's blade respectively.

RESULTS:- The haemodynamic response to laryngoscopy is significant if rise in the parameters such as heart rate, systolic BP, diastolic BP and mean BP is more than 20% above baseline values. After laryngoscope in macintosh v/s mccoy's group 20% rise in heart rate was 92% and 81%, 20% rise in systolic BP was 40% and 20%, 20% rise in diastolic BP was 67% and 10%, 20% rise in mean BP was 55% and 4% was obtained respectively. Glottic view after laryngoscopy was compared using Cormack and Lehane's grading(i.e. grade I to IV). In macintosh v/s mccoys group out of 65 patients grade I (is 70% and 86%), grade II (is 26% and 14%), grade III (is 6% and 0%), grade IV (is 0% in both group) was obtained respectively. Ease of intubation was compared using ease of intubation grading. In macintosh v/s mccoys group out of 65 patients grade 1(is 64% and 85%), grade 2 (is 36% and 15%), grade 3 and 4(is 0% in both groups) was obtained respectively.

CONCLUSION:- we can say that McCoy's blade shows overall minmal haemodynamic response and provides better glottic view and ease of intubation as compared to MacIntosh blade.

KEYWORDS

MacIntosh blade, McCoy's blade, laryngoscopy, stress response, glottis view, ease of intubation.

INTRODUCTION

Laryngoscopy forms an important part of general anaesthesia and endotracheal intubation. Laryngoscopes are used to view the larynx and adjacent structures, most commonly for inserting endotracheal tube into the tracheobronchial tree. The aim of laryngoscopy is to obtain good visualisation of vocal cords to facilitate smooth endotracheal intubation. Direct laryngoscopy depends on extension of the head at the atlanto-occipital joint and flexion of the lower cervical spine to align the oral, pharyngeal and laryngeal axis.

Many factors have shown to influence laryngoscopic view of vocal cords. These include forward displacement of mandible, prominent or absent teeth, backward displacement of tongue. The proof of this can be easily obtained by the existence of many different types of laryngoscopic blades. Futhermore, laryngoscopy and endotracheal intubation, trigger major stress responses; one in the form of increased catecholamines leading to tachycardia and hypertension and the other due to vagal stimulation leading to parasympathetic activation that manifests as bradycardia and hypotension both of these may be catastrophic in patients with ischemic heart disease or hypertension.[1,2] The hemodynamic response at the time of endotracheal intubation and laryngoscopy should be abolished to balance the myocardial O2 supply and demand which is a keynote in the safe conduct of anaesthesia.

Thus, the blades used for laryngoscopy should trigger minimal stress response and at the same time facilitate good laryngoscopic view for smooth endotracheal intubation.

Airway assessment and management is an important factor in the expertise of an anaesthesiologist. Maintaining a patent airway is a vital aspect of providing adequate oxygenation and ventilation. Failure to do so for even a brief period can be life threatening.

The three main causes of respiratory related injuries are- Inadequate ventilation, Esophageal intubation, Difficult tracheal intubation.

Airway assessment helps in recognizing before anaesthesia, the potential for a difficult airway and allows time for optimal patient preparation, correct selection of equipment and proper technique and participation of personal experienced in difficult airway management.[3] This prospective observational study was designed to evaluate the efficacy of McCoy's laryngoscope blade (straight) versus MacIntosh (curved) blade in providing good glottic view and reducing haemodynamic response during endotracheal intubation. This study was undertaken with the aim to compare the haemodynamic responses, glottic view and intubating conditions using McCoy's blade versus MacIntosh blade for intubation.

MATERIALS AND METHOD:-

A Prospective, Comparative, Single blind, Randomized Study was undertaken in Krishna Institute of Medical Sciences, Hospital and Research Centre, Karad, after obtaining ethical committee clearance as well as informed written consent from all patients. The study was carried from December 2016 to july 2018. 130 patients recruited for the study are randomly allocated into 2 groups i.e. into Group A and Group B of 65 patients each undergoing laryngoscopy with MacIntosh blade and McCoy's blade respectively. Randomisation was done with the help of Microsoft Excel. Then proforma was labelled either group A or group B according to randomisation and was put in the concealed envelope (no see through envelope).At the time of performing the study the envelope was taken serially and then MacIntosh or McCoy's blade was used accordingly. The calculated sample size of 80 patients was determined for the study according to 20% changes in heart rate after laryngoscopy for alpha value of 0.05 and power of 80%. However we took sample size of 130 patients for better validation of results. 15% dropouts were considered during the study.Thus 65 patients will be randomly allocated into each group i.e in Group A and Group B of both gender between 20 and 60 years of age belonging to ASA physical status I-II scheduled to undergo elective surgery under general anaesthesia with endotracheal intubation were recruited for this prospective, comparative study.

INCLUSION CRITERIA:-

- Patients undergoing various elective surgical procedures requiring general anaesthesia and endotracheal intubation

- Age group of 20-60 years of either gender with ASA physical status I and II

EXCLUSION CRITERIA:-

- Patients with morbid obesity
- Pregnant patients
- Patients with Diabetes Mellitus
- Patients with uncontrolled Hypertension
- Patients with Coronary Artery Disease
- Patients on Beta blocker therapy
- Patients with major kidney, liver and heart diseases
- Patients with allergy to any of the drugs used in the study.
- Mallampati grading IV

DATA COLLECTION:-

A routine pre-anaesthetic examination was conducted on the evening before surgery to have a detail physical assessment of the patient. All the required routine investigations was also done. All the patients received Diazepam 10mg orally at night on the day before surgery. On the day of surgery intravenous line was secured and premedicated with Inj. Fentanyl 1.5mcg/kg and Inj. Glycopyrolate 0.2mg I.V respectively. Aspiration prophylaxis i.e Inj. Ranitidine IV 50mg and Inj. Metoclopramide IV 10mg was given. Intraoperative monitoring was done with pulse oximetry, electrocardiography and automated non invasive blood pressure measurement. A preinduction heart rate, systolic and diastolic blood pressure were recorded.

ANAESTHESIA TECHNIQUE:-

All the patients were pre oxygenated with 100% oxygen for 3 minutes before induction. Induction was achieved with Inj. Propofol 1-3mg/kg I.V; muscle relaxation obtained with Inj.Suxamethonium 1.5mg/kg IV, and patient were put into "Sniffing position". Direct laryngoscopy was carried out by anaesthiologist who has minimum 5 years of clinical experience. MacIntosh blade was used in group A and McCoy's blade was used in group B respectively. Intubation was done with disposable, high volume low pressure cuffed endotracheal tube(ETT), using 7mm or 7.5mm internal diameter ETT for females and 8mm or 8.5mm internal diameter ETT for males.Heart rate, systolic, diastolic and mean blood pressure were recorded following pre-induction, post induction, immediately after laryngoscopy and at 3, 5, 10 mins intervals after laryngoscopy (or post intubation).Laryngeal view was obtained according to Cormack and Lehane grading were recorded. The degree of difficulty in intubation was obtained according to ease of intubation. Positioning, epinephrine infiltration throat packing and surgery were withheld until the completion of recording. Patients were connected to closed circuit and anaesthesia was maintained with oxygen (34%), N_2O (66%), sevoflurane 2.0% and non depolarising muscle relaxant vecuronium bromide and IPPV. Adequacy of ventilation was monitored clinically and SpO2 was maintained at 99 – 100%. At the end of the surgery, reversal was done with inj. Neostigmine 0.05 mg /kg and Glycopyrolate 0.01 mg/kg i.v.

STATISTICAL ANALYSIS:

Data analysis done using X^2 (chi- square test) for gender, ASA, MPG and ease of intubation; student (unpaired) "t' test was used for age and weight: these analysis were done using software Openepi version 3.

Fischer exact test was used for Cormack & Lehane grading; General linear model of multivariate was used for heart rate, systolic, diastolic and mean blood pressure: these analysis were obtained from software Statistical Package for the Social Sciences (SPSS; Windows ver 22.0, SPSS Inc, Chicago, IL). Results was considered statistically significant when P-value was <0.05.

RESULTS

The present study was conducted to compare the stress response, glottis view, ease of intubation between macintosh and mccoys laryngoscope blade.

Table 1:- Age and Sex wise Distribution in Group A and Group B

Age in Years	GROUP A		GROUP B	
	M	F	M	F
20-29	10	20	19	11
30-39	9	8	11	9
40-49	6	1	3	5
50-60	8	3	3	4
Total	33	32	36	29
Mean age	32.969±10.576		31.292±9.994	

Student unpaired 't' test, P value= 0.35(for age); X2= 0.278, P value= 0.598 (for gender)

There is no statistically difference in mean age of two groups (P value >0.05).Table shows that males and females were equally distributed in both groups (p value >0.05). Proportion of males were 50.77% & 55.38% and proportion of females were 49.23% & 44.61% in MacIntosh & McCoy's group respectively

Table 2 :- Comparison of Weights in Group A and Group B

	Group A	Group B
	Mean ± SD	Mean ± SD
Weight (kg)	54.462±7.205	55.831±7.487

Student unpaired t-test , P value = 0.29

Mean weight in group A was 54.462±7.205kg and in group B was 55.831±7.487kg. The mean weight in both the groups were comparable.

Table 3:- Distribution of study subjects according to ASA Grading

ASA GRADING	Group A	Group B	Total
I	42	46	88
II	23	19	42
Total	65	65	130

X^2=0.56, P value=0.45

Results shows that study subjects having ASA grade I were 64.62% & 70.77% in MacIntosh & McCoy's groups respectively. This difference in proportion was not statistically significant (p>0.05).

Table 4 :- Distribution of study subjects according to MP Grading

MP GRADING	Group A	Group B	Total
I	41	35	72
II	24	30	58
Total	65	65	130

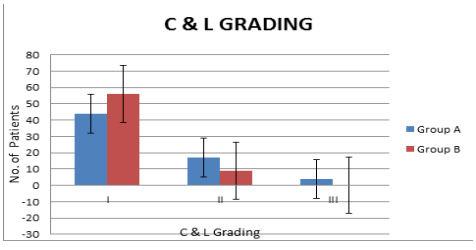
X^2=1.14 , P value= 0.286

The MP grading in both groups were comparable which means it is statistically not significant (P value> 0.05).

Table 5:- Distribution of study subjects according to C & L Grading

C & L Grading	Group A	Group B	Total
I	44	56	100
II	17	9	26
III	4	0	4
IV	0	0	0
Total	65	65	130

Fisher Exact test=7.56, P value=0.015



Graph:-1 Distribution of study subjects according to C & L Grading

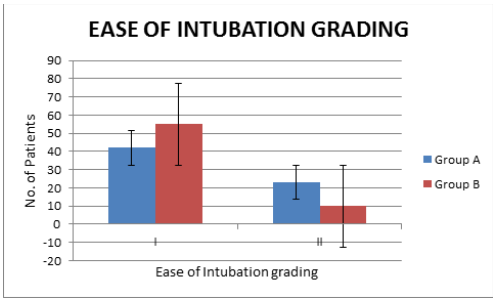
In MacIntosh group out of total 65 patients 67.69%, 26.15% and 6.15% subjects were having C & L grading 1, 2 & 3 respectively. Similarly in McCoy group out of total 65 patients 86.15%, 13.85% and 0% subjects were having C & L grading 1, 2 & 3 respectively. There was statistically significant difference in this observed proportions between two groups (p<0.05).

Table 6:- Distribution of study subjects according to Ease of Intubation

EASE OF INTUBATION	Group A	Group B	Total
I	42	55	97
II	23	10	33

III	0	0	0
IV	0	0	0
Total	65	65	130

X^2=6.86, P=0.008

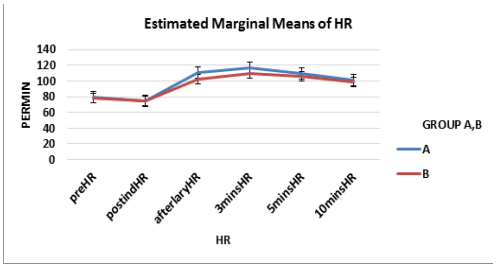


Graph:- 2 Distribution of study subjects according to Ease of Intubation

In MacIntosh group out of 65 patients approximately 64% and 36% patients shows ease of intubation grade I and grade 2 respectively. Similarly in McCoy's group approximately 85% and 15% patients shows ease of intubation grade I and grade 2 respectively. This difference in proportion between both the groups was statistically significant (p<0.05).

Table 7: Comparison of Heart Rate (HR) between Group A and B

	Descriptive Statistics			
	GROUP A,B	Mean	Std. Deviation	P value
Pre Induction HR	A	78.92	±3.693	0.155
	B	77.85	±4.819	
Post Induction HR	A	75.12	±3.170	0.849
	B	75.02	±3.252	
Immediately After Laryngoscopy HR	A	110.63	±9.209	<0.001
	B	102.66	±7.653	
3 Mins After Laryngoscopy HR	A	117.08	±10.182	<0.001
	B	109.58	±8.225	
5 Mins After Laryngoscopy HR	A	109.25	±11.429	0.068
	B	105.91	±9.160	
10 Mins After Laryngoscopy HR	A	100.55	±12.606	0.347
	B	98.85	±7.349	



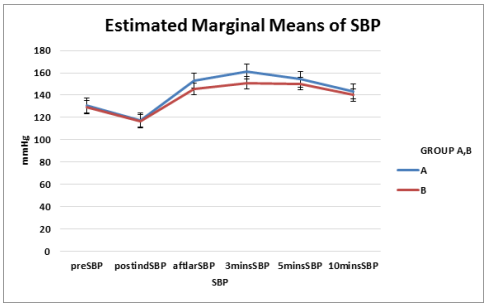
Graph 7: Comparison of Heart Rate between Group A and B

(preHR= pre induction heart rate, postindHR= post induction heart rate, afterlaryHR= immediately after laryngoscopy heart rate, 3minsHR= 3mins after laryngoscopy heart rate, 5minsHR= 5mins after laryngoscopy heart rate, 10minsHR= 10mins after laryngoscopy heart rate)

After applying General Linear Model for repeated measures, there was significant variations in heart rate between both groups. P value is <0.05.

Table 8: Comparison of Systolic Blood pressure (SBP) between Group A and B

	Group A, B	Mean	Std. Deviation	P value
Pre Induction SBP	A	130.42	±4.366	0.176
	B	129.34	±4.655	
Post Induction SBP	A	117.14	±4.213	0.586
	B	116.74	±4.151	
Immediately After Laryngoscopy SBP	A	153.23	±10.417	<0.001
	B	145.49	±12.521	
3mins After Laryngoscopy SBP	A	161.12	±11.059	<0.001
	B	150.86	±13.003	
5mins After Laryngoscopy SBP	A	154.14	±12.674	0.085
	B	150.20	±13.176	
10mins After Laryngoscopy SBP	A	143.57	±13.294	0.109
	B	140.12	±10.961	



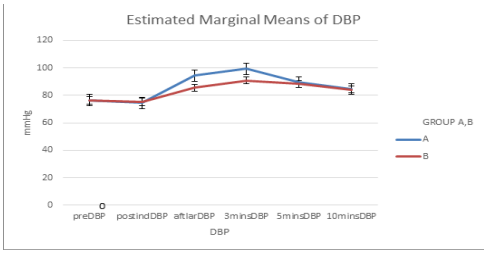
Graph 8: Comparison of Systolic BP between Group A and B

(preSBP= pre induction systolic BP, postindSBP= post induction systolic BP, afterlarySBP= immediately after laryngoscopy systolic BP, 3minsSBP= 3mins after laryngoscopy systolic BP, 5minsSBP= 5mins after laryngoscopy systolic BP, 10minsSBP= 10mins after laryngoscopy systolic BP)

After applying General Linear Model for repeated measures, there was significant variations in systolic BP between both groups. P value is <0.05.

Table No.9 : Comparison of Diastolic Blood Pressure(DBP) between Group A And B

	GROUP A,B	Mean	Std. Deviation	P value
Pre Induction DBP	A	76.60	±6.336	0.763
	B	76.28	±5.819	
Post Induction DBP	A	74.46	±6.503	0.470
	B	75.23	±5.550	
Immediately After Laryngoscopy DBP	A	94.34	±4.916	<0.001
	B	85.58	±5.525	
3mins After Laryngoscopy DBP	A	99.37	±5.213	<0.001
	B	90.85	±5.630	
5mins After Laryngoscopy DBP	A	89.58	±5.448	0.182
	B	88.34	±5.133	
10mins After Laryngoscopy DBP	A	84.51	±6.160	0.844
	B	84.32	±4.345	



Graph 9: Comparison of Diastolic BP between Group A And B

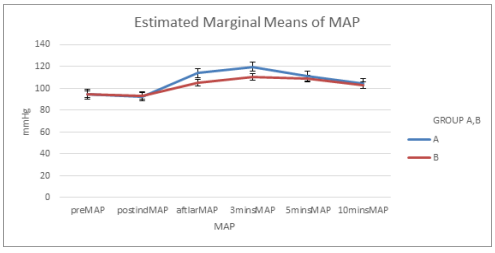
(preDBP= pre induction diastolic BP, postindDBP= post induction diastolic BP, afterlaryDBP= immediately after laryngoscopy diastolic BP, 3minsDBP= 3mins after laryngoscopy diastolic BP, 5minsDBP= 5mins after laryngoscopy diastolic BP, 10minsDBP= 10mins after laryngoscopy diastolic BP)

After applying General Linear Model for repeated measures, there was significant variations in diastolic BP between both groups. P value is <0.05.

Table 10: Comparison of Mean Arterial Pressure (MAP) between Group A And B

	Group A,B	Mean	Std. Deviation	P value
Pre Induction MAP	A	94.5792	±6.71814	0.950
	B	94.6515	±6.35815	

Post Induction MAP	A	92.7792	±7.07269	0.554
	B	93.4671	±6.10576	
Immediately After Laryngoscopy MAP	A	113.9691795	±5.73602535	<0.001
	B	105.5520000	±6.63191622	
3mins After Laryngoscopy MAP	A	119.9508	±6.13550	<0.001
	B	110.8565	±6.90804	
5mins After Laryngoscopy MAP	A	111.52369	±5.991752	0.022
	B	108.92842	±6.721983	
10mins After Laryngoscopy MAP	A	104.19452	±6.757268	0.241
	B	102.95446	±5.133671	



Graph 10: Comparison of Mean BP between Group AAnd B

(preMAP= pre induction mean arterial pressure, postindMAP= post induction mean arterial pressure, afterlaryMAP= immediately after laryngoscopy mean arterial pressure, 3minsMAP= 3mins after laryngoscopy mean arterial pressure, 5minsMAP= 5mins after laryngoscopy mean arterial pressure, 10minsMAP= 10mins after laryngoscopy mean arterial pressure)

After applying General Linear Model for repeated measures, there was significant variations in mean BP between both groups. P value is <0.05.

DISCUSSION

Laryngoscopy forms an important part of general anaesthesia and endotracheal intubation. To aid and ease the process of intubation, laryngoscopic blades of different shapes have been designed and studied. The shape of a laryngoscope blade affects the exposure of the larynx. Laryngoscopy and endotracheal intubation trigger major stress response, in the form of increased catecholamines leading to tachycardia and hypertension, which may be catastrophic in patients with cardiovascular disease. In view of the frequent occurrence of hypertension and tachycardia during laryngoscopy even in normotensive individuals, it is perhaps rather surprising that the complications have not been met very often . One reason for this may be the transient nature of hypertension which usually lasts less than 10 minutes. It is possible however that some of the complications that occur during intubation or even later in the course of anaesthesia may be precipitated by an episode of hypertension and tachycardia, following endotracheal intubation.

It has been observed that amount of forces exerted during laryngoscopy and intubation is the key determinant for mechanical stimulation of stretch receptors present in the respiratory tract. Thus, use of different types of laryngoscope blades can help in decreasing this response and at the same time facilitate good laryngoscopic view for smooth endotracheal intubation. The McCoy's blade, a modification of the standard MacIntosh blade was introduced in 1993. The tip of the McCoy's blade is hinged and when the blade is inserted into the vallecula, the tip acts on the hyoepiglottic ligament and lifts the epiglottis out of view to expose more of the glottis by compression of the lever attached to the proximal end of the blade.

In this prospective randomised study total number of 130 patients in the age group of 20-60 years were included in the study. The study population was divided into 2 groups with 65 patients in each group. We have evaluated the haemodynamic response, glottic view, ease of intubation using conventional MacIntosh blade and is compared with that obtained using McCoy's blade.

In our study, we have used haemodynamic parameters such as heart rate, systolic BP, diastolic BP and mean BP changes after laryngoscope. To have a significant change there should be more than 20% rise in all or maximum parameters possible and these changes should be shown by statistically significant number of patients while comparing between both the groups.

The haemodynamic response to laryngoscopy is significant if rise in the parameters such as heart rate, systolic BP, diastolic BP and mean BP is more than 20% above baseline values. In present study more than 20% rise in heart rate after laryngoscopy was shown by 92% of the patients in MacIntosh group and 81% of patients in McCoy's group. However this finding shows statistically significant but clinically McCoy's laryngoscope shows marginal benefits in reducing tachycardia as compared to MacIntosh laryngoscope. More than 20% rise in systolic BP after laryngoscope was shown by 40% and 20% of patients in MacIntosh and McCoy's group respectively. However this finding is both statistically and clinically significant which means McCoy's laryngoscope shows more benefits in producing less increase in systolic BP after laryngoscopy as compared to MacIntosh group. More than 20% rise in diastolic BP after laryngoscope was shown by 67% and 10% of patients in MacIntosh and McCoy's group respectively. However this finding is both statistically and clinically significant which means McCoy's laryngoscope shows more benefits in producing less increase in diastolic BP after laryngoscopy as compared to MacIntosh group. Lastly more than 20 % rise in mean BP after laryngoscopy was shown by 55% and 4% of patients in MacIntosh and McCoy's group respectively. However this finding is both statistically and clinically significant which means McCoy's laryngoscope shows more benefits in producing less increase in mean BP after laryngoscopy as compared to MacIntosh group. This shows overall haemodynamic response to laryngoscopy is more with MacIntosh blade as compared with McCoy's blade which was also found statistically significant (P value<0.05) as shown by McCoy's et al.

In the study conducted by McCoy's, Mirakhur[6] et al, compared the stress response to laryngoscopy, using the MacIntosh and McCoy's blade. The cardiovascular changes and catecholamine concentrations before and after laryngoscopy with either the MacIntosh or the McCoy's laryngoscope blades were compared. There was significant increase in both heart rate (33%) and arterial blood pressure (27%) after laryngoscopy using the MacIntosh blade (P < 0.01). Use of the McCoy's blade did not result in any significant change in either heart rate or arterial blood pressure. It was concluded that the stress response to laryngoscopy is less marked with the use of McCoy's blade and it is probably due to a reduction in the force necessary to obtain a clear view of the larynx

In another study conducted by Nishiyama[10] et al, compared the stress response during laryngoscopy using three different laryngoscopes, MacIntosh, Miller, or McCoy's. Blood pressure, heart rate (in 58 patients) and plasma concentration of catecholamine (in 29 patients) were measured before, during and after laryngoscopy without tracheal intubation. The results suggest that the stress response during laryngoscopy without intubation is the highest with the Miller blade and the least with the McCoy's blade.

The glottis view after laryngoscopy was compared using Cormack and Lehane's grading. In MacIntosh group out of total 65 patients 67.69%, 26.15% and 6.15% patients were having C & L grading 1, 2 & 3 respectively. Similarly in McCoy's group out of total 65 patients 86.15%, 13.85%and 0% patients were having C & L grading 1, 2 & 3 respectively. This shows visualization of glottis was better with McCoy's blade as compared with MacIntosh blade which was found statistically significant (P value < 0.05) as shown by Sakai et al.

Sakai[5] et al., compared effectiveness in visualization of the vocal cord during orotracheal intubation with McCoy's compared with MacIntosh and Miller blades were investigated, 117 patients for elective surgery under general anaesthesia requiring tracheal intubation were investigated. They found that the grades of laryngeal visualization with McCoy's a type of Flexitip blade weremsignificantly better than those with MacIntosh blades.

Cook[8] et al., in their study found that the blade activation of the McCoy's laryngoscope significantly improves laryngoscopic view.

Harioka[13] et al., studied 219 patients and concluded that without external laryngeal pressure, the McCoy's a type of Flexitip blade laryngoscope provided a better laryngoscopic view than that obtained by the MacIntosh laryngoscope (p<0.001).

The ease of intubation was compared using ease of intubation grading. In MacIntosh group out of 65 patients approximately 64% and 36%

patients shows ease of intubation grade I and grade 2 respectively. Similarly in McCoy's group approximately 85% and 15% patients shows ease of intubation grade I and grade 2 respectively.It was found that intubation was easy in group B as compared to Group A. This shows ease of intubation was better with McCoy's blade as compared to MacIntosh blade which was found statistically significant (P value <0.05 i.e 0.008) as shown by Arino et al.

Arino[9] et al., evaluated 500 patients scheduled to undergo elective surgery requiring endotracheal intubation. Patients were randomly assigned to 5 groups of 100 patients each. The laryngeal view was classified according to Cormack and Lehane grading. Laryngoscopic view obtained with the Belescope and Miller laryngoscope was similar and better than with the other types of laryngoscopes. The levering tip of the McCoy's Blade and Fibreoptic device of Lee – fibreoptic significantly improved the laryngoscopic view with regards to difficult intubation; the best results were obtained with the McCoy's and MacIntosh Blades.

In another study by Leon[11] et al, showed that Flexitip blade significantly improved intubating conditions. The laryngoscopic view was compared in 100 patients with the flexitip blade first in its normal position and after levering the distal part of the blade. All patients were in Mallampati class I and II. Among them 16% were classified as Cormack and Lehane grades 3 or 4 when using the blade in the normal position. The levering tip of the distal part of the blade significantly decreased the incidence of Cormack and Lehane grades 3 or 4 (2 verses 16% P = 0.001). The Flexitip blade significantly improves intubating conditions.

McCoy's[7] et al., studied the forces exerted at laryngoscopy with the McCoy's and MacIntosh blades in 40 patients. The variables measured were the duration of laryngoscopy, the maximally applied forces and mean forces. They concluded that the McCoy's blade results in significantly less force applied during laryngoscopy. This may be the reason for the reduction in the stress response reported previously with the use of McCoy's blade.

CONCLUSION

Based on the present study carried out the following conclusion can be made that McCoy's blade shows significant- less increase in haemodynamic response, good visualization of glottis, better ease of intubation Thus we can conclude that McCoy's blade shows overall minmal haemodynamic response and provides better glottic view and ease of intubation as compared to MacIntosh blade.

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