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POSTOPERATIVE SORE THROAT AFTER LARYNGOSCOPY WITH MACINTOSH VERSUS VIDEOLARYNGOSCOPE BLADE

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ABSTRACT **Introduction:** Direct laryngoscopy guided by a Macintosh curved blade, is the standard traditional method of endotracheal intubation in patients under general anaesthesia. Post Operative Sore Throat [POST] is a common problem faced. With the advent of newer technology, various videolaryngoscopes have come into usage. **Aim:** To know the incidence of sore throat after intubation with the Macintosh versus videolaryngoscope. To compare the incidence of hoarseness, hemodynamic response and time taken for intubation by two methods. **Method:** A prospective, randomized study was conducted on 110 patients with normal airway undergoing general anaesthesia for elective surgeries. Patients were enrolled into two groups randomly by Systemic Randomization Technique. All patients underwent thorough pre-anaesthestic evaluation with general and systemic examination. In the operation theatre, baseline vital parameters were recorded. The standard anaesthetic regimen and surgical procedures was followed. Postoperative sore throat was assessed with 10 point score at 0,6,12,24 hours post extubation. **Result:** The mean incidence of sore throat at 0,6,12 and 24 hours post extubation was 6.67, 5.44, 4.91 and 3.93 in the Macintosh group whereas 4.18, 3.09, 1.22 and 1.25 in the videolaryngoscope group. The mean time taken for intubation was 19.5 sec in Macintosh group and 36.6 sec in videolaryngoscope group. All patients were haemodynamically stable throughout the procedure. Conclusion: The incidence of postoperative sore throat was more with Macintosh blade whereas the time taken for intubation and the hemodynamic stability was more with the videolaryngoscope blade.

KEYWORDS : Postoperative sore throat, Macintosh blade, Videolaryngoscope, Hoarseness of voice.

INTRODUCTION

Direct laryngoscopy guided by a Macintosh curved blade is the standard, traditional method of endotracheal intubation in patients under general anaesthesia.1 Postoperative sore throat [POST] is a common problem leading to hoarseness of voice having variable incidence. It hampers the normal functioning of the individual. POST has been rated by patients as the eighth most adverse effect in the postoperative period. Various methods have been used to reduce sore throat like IV lignocaine, application of lignocaine jelly on ET tube, use of drugs to prevent the intubation response. The method of airway management is an important factor for the causes of postoperative sore throat.[1]

Mucosal injury, stretch of ligaments and muscles of throat, prolonged surgery, changing positions of patient during surgery have been implicated in the pathogenesis of postoperative sore throat.2 Videolaryngoscope has better laryngoscopic view in both routine and difficult airway patients. Injuries to lips, buccal mucosa, hypopharynx, tongue and epiglottis, dental injuries can occur during the insertion of a laryngoscope or its manipulation in an effort to improve laryngeal exposure. Videolaryngoscopes aids in a more predictable laryngeal visualization, with less traction applied to the soft tissues and thereby lessening the chance of associated injuries.[3]

AIMS & OBJECTIVES

This study was designed to assess the incidence of postoperative sore throat after intubation with MacIntosh laryngoscope versus videolaryngoscope blade in normal airway patients; so also to compare the incidence of hoarseness, hemodynamic response and time taken for intubation by two methods.

MATERIALS & METHODS

After approval from ethical committee a prospective, randomized, double blind comparative study was carried out at tertiary care center with 110 patients.

Inclusion and exclusion criteria: ASA class I and II, patients willing to participate, posted for elective surgery under GA, patients with normal airway findings, age between 18-50 years, height 145-165 cm and BMI <30Kg/m 2 were included . Whereas patients having difficult airway, history of facial trauma, syndromic features. ASA grade III and IV, patients with significant cardiovascular, renal, hepatic dysfunction and morbidly obese patients were excluded from the study.

Method of collection of data: Participants were randomly allocated into 2 groups of 55 each.

Group M- MacIntosh group (n=55)

Group V- Videolaryngoscope group (n=55)

All patients underwent routine pre-anaesthestic evaluation with thorough general and systemic examination. Written informed consent was obtained from patients in both groups. All routine investigations were done. Patients were kept NPO for 8 hrs before surgery. In the preoperative room, IV line was secured. In the operation theatre, ASA standard monitoring devices pulse oximetry, NIBP and ECG were attached and baseline vital parameters were recorded. After preoxygenation with 100% oxygen for three minutes, premedication was given with Inj. Ondensetron 4mg, Inj.Midazolam 1mg and Inj. Fentanyl 100mcg and induced with Inj. Thiopentone 5mg/kg , intubated with Inj.Scoline (2mg/kg) and maintained on oxygen, nitrous, Isoflurane/Sevoflurane. Inj. Neostigmine 50mcg/kg and Inj. Glycopyrrolate 8mcg/kg was given before extubation. Hemodynamic parameters heart rate, systolic blood pressure, diastolic blood pressure, ECG, SpO2 were monitored just after intubation and then throughout the procedure. Postoperative monitoring chart was done at 0,6,12,24 hours for sore throat and hoarseness of voice. The severity of sore throat was assessed by using a 10 point score:

Score 0 : No sore throat
Score 1-3 : Mild sore throat (complains of sore throat only on asking)
Score 4-7 : Moderate sore throat (complaints of sore throat on his/her own)
Score 8-10 : Severe sore throat (change of voice or hoarseness, associated with throat pain)

STATISTICALANALYSIS DETAILS

Data was analysed by using SPSS 24.0 version.Qualitative data was expressed in terms of percentages and proportions. Quantitative data was expressed by unpaired t test . Descriptive statistics of each variable was presented in terms of Mean, standard deviation, standard error of mean. A p value of <0.05 was considered as statistically significant whereas a p value <0.001 was considered as highly significant.

RESULTS

The demographic data with age, gender, weight and height of participants was compared and was found statistically nonsignificant. (p value >0.05) . The baseline vital parameters like PR,SpO2,RR,SBP,DBP and MAP were comparable between both the groups and no statistically significant difference was found.

Table No.1 : Difference in the baseline parameters and 1 minute after intubation

Difference in the baseline and 1 minute after intubation		N	Mean	Std. Deviation	t	p	Inference
PR	Group M	55	8.56	2.6	2.300	0.025	Significant
	Group V	55	5.46	1.5		(<0.05)	
RR	Group M	55	2.36	1.5	2.130	0.030	Significant
	Group V	55	1.1	0.5		(<0.05)	
SBP	Group M	55	12.3	4.5	3.120	0.045	Significant
	Group V	55	8.25	2.3		(<0.05)	
DBP	Group M	55	5.56	2.5	3.400	0.049	Significant
	Group V	55	3.25	1.36		(<0.05)	
MAP	Group M	55	4.26	1.5	2.400	0.046	Significant
	Group V	55	3.25	1.6		(<0.05)	

In the above table, we have compared the baseline vital parameters and that at 1 min after intubation between both the groups and the p value turned out to be statistically significant. Thus it could be inferred that Group V was more hemodynamically stable. The same is graphically depicted below.

Graph No.1 : Graphical representation of difference in the baseline parameters and 1 minute after intubation

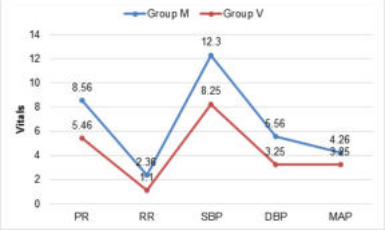
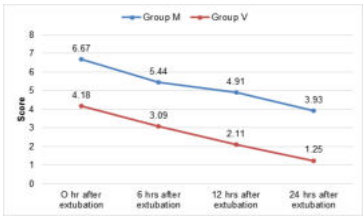


Table No.2 : Comparison of sore throat grade between Group M and Group V

Sore throat grade	N	Mean	Std. Deviation		t	p	Inference
0 hrs after extubation	Group M	55	6.67	1.22	11.22	0.0001	Highly significant
	Group V	55	4.18	1.11		(<0.01)	
6 hrs after extubation	Group M	55	5.44	1.23	10.88	0.0001	Highly significant
	Group V	55	3.09	1.02		(<0.01)	
12 hrs after extubation	Group M	55	4.91	1.22	13.29	0.0001	Highly significant
	Group V	55	2.11	0.98		(<0.01)	
24 hrs after extubation	Group M	55	3.93	1.39	11.81	0.0001	Highly significant
	Group V	55	1.25	0.95		(<0.01)	

Sore throat incidence at the end of 0,6,12 and 24 hours of extubation was compared between two groups and significant difference was noted. The same is graphically depicted below.

Graph No.2 : Graphical representation of sore throat grade



The p values of sore throat grades at 0,6,12 and 24 hours after extubation between the two groups was 0.0001 which was highly significant. Thus it could be inferred that the incidence of POST was more in Group M compared to Group V.

Table No.3:Comparison of time taken for intubation - Group M and Group V

		N	Mean	Std. Deviation	t	p	Inference
Time for intubation	Group M	55	19.5	7.9	3.250	0.001	Highly Significant
	Group V	55	36.6	8.5		(<0.05)	

The mean time taken for intubation in Group M was 19.5 and in Group V was 36.6 The p value was 0.001 which was highly significant.

Perioperative side effects viz. excess time and attempts taken for intubation and postoperative nausea /vomiting were compared and no significant difference was noted.

DISCUSSION

Even though direct laryngoscopy is a widely accepted traditional technique for endotracheal intubation , soft tissue injuries, postoperative sore throats, with a reported incidence of up to 90% and hemodynamic adverse events are common issues with it.

Among these, most common problem following tracheal intubation is post-operative sore throat (POST), which can occur anywhere between 14% and 50% of the time.[4] The pathophysiology of POST has been linked to mucosal damage, throat muscle and ligament stretching, protracted surgery, and patient positioning during surgery. In his investigation, Chandler et al. established a relationship between mechanical forces and POST, demonstrating the critical role that pressure trauma plays in causing POST.[4]

Video technological advancements have led to the emergence of more dependable, potent, and affordable videolaryngoscopes offering less pressure trauma to the surrounding mucosa and hence less chance of POST.

In a study conducted by Najafi et al, [5] it was seen that at 6, 24 and 48 hours following surgery, there was a considerably decreased incidence and severity of sore throat in the Glide Scope group than in the Macintosh laryngoscope group. Additionally, the incidence of hoarseness was much lower in the Glide Scope group than in the Macintosh laryngoscope group after 6 and 24 hours following the operation. At 6 and 24 hours following surgery, men experienced less sore throat than women did in terms of frequency and severity.

Our research revealed that the VL group experienced postoperative hoarseness and painful throat less frequently than the MacIntosh group. Glottic inlet viewing was made easier by VL. It was possible to intubate without having to line up the oral, pharyngeal, and tracheal axes. Additionally, it required a gentler laryngoscopy and caused less tissue stress.[6] It becomes sense to assume that decreased tissue stress in the VL group accounts for the lower postoperative sore throat and hoarseness. The results of study of Chandler et al, (which used mechanical models) revealed that mechanical trauma plays a significant role in the pathogenesis of PST and that there is a positive correlation between mechanical forces and POST. Generally speaking, tracheal intubation can be challenging in people who are obese and may be linked to a higher risk of delayed emergence. For instance,

Shiga et al.[7] showed that patients with a body mass index of > 30 kg/m2 had a 15.8% incidence of difficult intubation compared to 5.8% in the general population, while Juvin et al.[8] reported a 15.5% incidence compared to 2.2%. Research by Arici et al. and Ndoko et al. revealed that the VL reduced the time needed to intubate obese patients' trachea compared to the Macintosh laryngoscope.[6]

The advantages of VL over direct Macintosh laryngoscopy during the past few years have included a higher success rate, quicker intubation time, and a better view of the glottis.[9] The laryngoscopist must generally align the oral, pharyngeal, and laryngeal axes, which extend from the incisor teeth to the larynx, in a straight line in order to perform tracheal intubation with the Macintosh laryngoscope.[10] To display an image of the glottis on an external display monitor, a video laryngoscope, on the other hand, has a digital camera built into the tip of its blade. Additionally, a system of mirrors, prisms, and lenses to transport the image from the lit tip to a nearby viewfinder can also be employed. All these factors can contribute to decrease the incidence of sore throat.

The difficulty of laryngoscopy, the number of intubation attempts analysed, and the type and extent of education provided prior to tracheal intubation attempt are some of the differences between these two techniques.[11]

In the present study, VL was found to be a better intubation technique as compared to the Macintosh as seen through comparison between the parameters. Similar reports have been highlighted by multiple authors. In general, tracheal intubation in obese patients can be challenging and is linked to a higher risk of intubation time delay because of factors such glottic oedema, restricted posterior neck flexion, a short neck length, and restricted oropharyngeal space, which may obstruct adequate visualisation. The oral, pharyngeal, and laryngeal axes must be brought into a straight line for glottic visualisation with the Macintosh laryngoscope, but not for glottic visualisation with a VL.[12] The tongue and buccal mucosa can also obstruct the view of the glottic aperture during tracheal intubation with the Macintosh laryngoscope. Patients who are obese are more likely to experience this issue because their oropharyngeal area can become congested due to tongue oedema or the presence of buccal mucosal fat.[13] This finding indicates that VL with tracheal tube guides have faster intubation times and may be more effective for tracheal intubation than those without them.They also offer less chances of sore throat in postoperative period.

Once the glottis has been seen, a groove on the Airtraq and Airwayscope laryngoscopes aids in smoothly guiding the tracheal tube into the trachea. With the help of this feature, smooth tracheal intubation can be carried out without the need for tracheal guiding equipment like gum elastics, cutting down on intubation time. When using VL without guide grooves, the oropharyngeal space, particularly in obese patients, might be restricted by fat in the buccal mucosa or oedema of the tongue, preventing the tracheal tube from being inserted smoothly.

Therefore, the findings of the present study tends towards proving that the videolaryngoscopy is a better alternative or easily performed intubation technique with less incidence of postoperative sore throat which is advantageous over the Macintosh method of intubation.

CONCLUSION

It can be concluded that the incidence of postoperative sore throat is more with MacIntosh blade whereas the time taken for intubation and hemodynamic stability is more with videolaryngoscope.

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