



Research Article

Postoperative Laryngeal Morbidity –Comparison between Endotracheal Tube and Laryngeal Mask Airway

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Abstract

Background & Aims -This randomised prospective study was carried out to study and compare incidence of laryngopharyngeal morbidity when laryngeal mask airway (LMA) was used as an alternative to endotracheal tube (ETT) in mechanically ventilated patients.

Methods -this study was carried out in 70 patients of age gp 18-60, ASAgr1-2, both sexes, posted for surgical procedure under GA of duration 30-120 min. These pts randomly divided into 2 gps-GpE(n-35) in which portex ETT used and Gp L(n-35) in which LMA used. Postoperatively reaction to extubation, laryngeal morbidity like soreness, hoarseness observed.

Result- We found incidence postoperative sore throat more in Gp E (57.4%) compared to Gp L(34.28%), Also incidence of hoarseness in Gp E(31.42) compared to Gp L(11.42%), While dysphagia found more in Gp L(22.85%) as compared to GpL(5.71). Complaints altogether was observed more in Gp E(71.42) than Gp L(51.42).

Conclusion- LMA is superior to endotracheal tube due to less incidence of postoperative laryngopharyngeal morbidity though difference was statically insignificant, also more precise symptoms like sore throat, hoarseness was more with ETT.

Keywords- Laryngopharyngeal morbidity, Laryngeal mask airway, sorethroat, hoarseness, intubation.

Introduction

For administration of general anaesthesia, securing of airway is very important. Since 18th century endotracheal intubation is the mainstay in general anaesthesia practice. Endotracheal intubation associated with few postoperative complaints like sore throat, hoarseness, trauma, difficulty in swallowing. various measures like use of smaller tracheal tube¹, low pressure high volume cuff, lubrication with lignocaine jelly² were suggested to reduce post laryngopharyngeal morbidity. LMA being

supraglottic device, available with cuff fills niche between facemask and tracheal tube, is increasingly used for daycare, short duration procedure, also found to reduce postoperative morbidity^{3,4,5}. We conducted this study to compare use of LMA with ETT for postoperative laryngopharyngeal discomfort in elective surgical patients.

Material and Methods

After obtaining institutional ethic committee approval and informed consent from each patient, 70

patients (pts) of 18-60 yrs age group, American society of anaesthesiologist (ASA) physical status I or II, scheduled for elective surgical procedure expected to last for 30 to 120 minutes were included in this randomized prospective study. Patients with anticipated difficult airway mallampatti grade III/IV, obese, at risk of regurgitation, laparoscopic surgery, head-neck surgery, local pharyngeal-laryngeal pathology like tumor, abscess, enlarged tonsils, pregnant women, history of sore throat, surgery in prone-lateral position, with decreased lung compliance, requiring ryle's tube during or after surgery were excluded from study.

Preoperative check up done, all essential indicated investigation and haemodynamic variables noted and patients were advised overnight fasting. patients received tab ranitidine 150 mg, tab diazepam 10 mg on a day before surgery. patients were randomly divided into 2 groups- GP E (n=35) in which portex cuffed ETT of no 7 for females and no.8 for males used for intubation. And GP-L (n=35) in which LMA of no 3 for females and no 4 for males used. In operation theatre (OT), intravenous line secured with 20 G intracath and basal pulse rate, blood pressure, spo2 noted. pts premedicated intravenously with inj. midazolam (0.05 mg/kg) + inj. fentanyl (2 mcg/kg) and inj. glycopyrolate (0.004 mg/kg). after preoxygenation with 100% oxygen for 3 minutes, pts induced with inj. propofol (2 mg/kg) and inj. succinylcholine (2 mg/kg). Then pts were intubated with either ETT or LMA. Cuff of the ETT and LMA lubricated with water soluble K-Y jelly, intubation done with McIntosh curve blade laryngoscope and LMA inserted using Brains method by sliding it along hard palate, soft palate, posterior pharyngeal wall, till its final position in hypopharynx. cuff inflated with air to prevent air leak and with 25 ml in size 4 LMA and 20 ml for size 3 LMA. Proper placement and air entry confirmed with auscultation and ETCO₂. Attempt of insertion noted, anesthesia maintained with oxygen + nitrous oxide + sevoflurane + inj vecuronium (0.1 mg/kg) with intermittent positive pressure ventilation. after procedure, pts reversed with intravenous inj. neostigmine (0.05 mg/kg) and

inj. glycopyrolate (0.008 mg/kg). Airway device removed if pts was able to follow simple commands. Gentle oropharyngeal suction done. Reaction to extubation was noted as coughing, biting, retching, vomiting, bronchospasm, laryngospasm. Failed intubation/insertion, blood detected or not on LMA or ETT, also duration of anesthesia noted. Postoperatively pts were interviewed at 6, 12, 24 hrs for sore throat, hoarseness, dysphagia with water drinking. Sore throat, hoarseness graded as sore throat as grade 0-none, grade 1-minimal throat irritation/pain, grade 2-moderate throat irritation/pain, grade 3-severe throat irritation/pain. And hoarseness as grade 0-none, grade 1-noted by patient, grade 2-obvious to observer, grade 3-aphonia. also dysphagia noted as pain during drinking water. Statistical analysis of data done. Descriptive data tested using two tailed independent t-test, categorical data by chi-square test, mann whitey u test for ordinal data. continuous data presented as mean ± SD. P value < 0.05 taken statistically significant.

Results

In this study, we found both groups were similar in demographic data. The reduction in incidence of postoperative sore throat was observed from 57.4% to 34.28% with use of LMA as compared to ETT but statistically not significant. The mild (51.42%) and moderate (5.71%) sore throat was observed more in Gp E, while in Gp L only mild sore throat was observed in 34.28% patients. Severe sore throat not seen in both groups. The longer duration of sore throat was observed in Gp E (31.42% pts during 12 to 24 hrs and 14.2% for more than 24 hrs after surgery) while no pt had sore throat in Gp L of duration more than 24 hrs. The statistically significant low incidence of hoarseness found in Gp L (11.42%) compared to Gp E (31.42%). The dysphagia was observed more in Gp L (22.85%) compared to Gp E (5.71%) but statistically not significant. In the early postoperative period the dryness of mouth observed more in tracheal tube group than LMA group. The incidence of vomiting and nausea in Gp E (5.71%, 11.42% respectively) and in Gp L

(14.28%,8.57% respectively), statistically insignificant. There was no significant difference in incidence of nausea and vomiting in both groups. When laryngotracheal complaints (LPC) like sore throat, hoarseness, dysphagia combined altogether, the incidence of these found more in GpE(71.42%) than in Gp(51.42%),but stastically insignifant. The incidence of LPC was more in pts requiring second attempt for intubation or LMA insertion in both groups, but stastically insignificant. The incidence of LPC was more in patients of either groups, who required second attempt for intubation or LMA insertion. In Gp E, All pts who required second attempt had LPC compared to 67.74% pts intubated in first attempt and in Gp L, 66.67% pts had LPC in second attempt of LMA insertion compared to 33.33% in first attempt insertion.

Table 1 showing distribution of pts according to postoperative sorethroat score at different time interval

So re thr oat	Group E(n%) n=35				Group L(n%) n=35				P value
	Score								
	0	1	2	3	0	1	2	3	
6 hrs	16(45.71%)	18(51.42%)	1(2.85%)	0	23(65.71%)	12(34.28%)	0	0	0.08 nonsignificant
12 hrs	19(54.28%)	15(42.85%)	1(2.85%)	0	25(71.42%)	10(28.57%)	0	0	0.12nonsignificant
24 hrs	29(80%)	6(20%)	0	0	35(100%)	0	0	0	0.01significant

Table 2-showing distribution of patients according to postoperative hoarseness at different time interval

Hoarseness	E=(n%) n=35				L(n%) n=35				P value
	Score								
	0	1	2	3	0	1	2	3	
6 hrs	24(68.57%)	11(31.42%)	0	0	31(88.57%)	4(11.42%)	0	0	0.04 significant
12 hrs	28(80%)	7(20%)	0	0	34(97.14%)	1(2.85%)	0	0	0.02significant
24 hrs	33(94.28%)	2(5.71%)	0	0	35(100%)	0	0	0	0.15nonsignificant

Table 3-distribution of pts according to incidence of laryngopharyngeal complaints(LPC)

Lpc	Gr E	Gr L	P value
Sorethroat	20(57.4%)	12(34.28%)	0.09
Hoarseness	11(31.42%)	3(8.57%)	0.03
Dysphagia	2(5.7%)	8(22.85%)	0.08

Discussion

The major responsibility of anaesthesiologist towards pts is to provide adequate airway and ventilation. although endotracheal intubation has long history as a most widely accepted technique in anaesthesiology practice, it is not without complications, most of which arises from the need to visualise and penetrate the laryngeal opening. Sore throat is a common postoperative complaint after intubation. The various factors likely to influence sore throat incidence have been studied. The smaller tracheal tube reduce incidence of postoperative sorethroat^{9,10,11,12}. The tracheal tube design has been cause of postoperative sore throat. Effect of high volume, low pressure cuffs were studied extensively .high volume cuffs were associated with increased incidence of sore throat due to greater area of cuff tracheal contact.^{2,6} .there is higher incidence of sore throat when either the cuffed tubes were lubricated with lignocaine ointment or application of laryngotracheal lignocaine spray⁷. The LMA first described by Aij Brain in 1983 has gained popularity in anaesthesiology practice, especially in day care and short duration surgery. There are many advantages of LMA over intubation like easy to learn placement, doesn't need laryngoscopy or muscle relaxation, less haemodynamic and intraocular pressure changes during insertion and removal of LMA, less likely cause injury, useful in difficult intubation, surgery of professional singers, incidence of sore throat coated to be less. The aim of our study was to compare incidence of post operative laryngopharyngeal complaints morbidity, when LMA was used as an alternative to ETT in mechanically ventilated patients. In our study, 88.57 pts were intubated in first attempt and 11.42 % in second attempt, while successful LMA insertion in first attempt (74.28%) and in second attempt (25.71 %). the difference is stastically insignificant. similar results also found by J Monteiro⁸, Matta Et Al⁹, Wakeling¹⁰, Girish Joshi⁴. The incidence of sore throat in our study was 57.42 with ETT AND 34.28 with LMA, Which was also comparable with studies of Girish Joshi⁴, Stout,E.Loesser¹¹, Reza Safaeian et al¹³. In this study,

the significantly low incidence of hoarseness with LMA (11.42%) as compared to ETT (31.42%). severe hoarseness associated with streamlined liner of the pharyngeal airway also longer duration of was observed in pts intubated with ETT than LMA, though less than 24 hrs in both gps. these results were comparable with results of study of ARMIN Reger³, Stout, Figueredo¹⁴. The difficulty in swallowing and drinking water found in 5.11% pts of Gp E and 22.85% pts of Gp.L.Similar results found by Armin Rieger. So overall incidence of laryngopharyngeal complaints which included sore throat ,hoarseness, dysphagia, it was observed that the incidence is more when ETT was used as compared to LMA(P>0.05)

Conclusions

From this study, we concluded—

LMA is superior to ETT with regard to postoperative laryngopharyngeal complaints. There is a reduction in incidences of postoperative laryngopharyngeal complaints with the use of LMA as compared to ETT, though statically not significant. However when more precise symptoms like sore throat, hoarseness, dysphagia were considered, incidence of sore throat and hoarseness was more with ETT and dysphagia was more likely with LMA.

Acknowledgement: NIL

Source of support: nil

Conflict of interest: nil

References

1. David m stout et al-correlation of endotracheal tube size with sore throat and hoarseness following general anesthesia. *Anaesthesiology* 1987;67:419-421.
2. Edward a Loeser et al –reduction of postoperative sore throat with new endotracheal tube cuff. *Anaesthesiology* 1983;58;376-379
3. Armin Rieger et al-intracuff pressure do not predict laryngopharyngeal discomfort after use of laryngeal mask airway. *Anesthesiology* 1997;87;63-67.
4. Girish p Joshi et al-use of laryngeal mask airway as an alternative to tracheal tube during ambulatory anesthesia. *Anesthesia. Analg.*1997;85;573-7.
5. O'Neill et al-Effect of humidification of inspired gases with LMA
6. Edward a Loeser et al – Endotracheal tube cuff design and postoperative postoperative sore throat. *Anaesthesiology* 1976;45;684-687.
7. C Keller et al-Laryngeal mask lubrication:a comparative study of saline vs 2% lignocaine gel with cuff pressure control. *Anesthesia* 1997;52;586-602.
8. J.Monterio –a clinical appraisal of Brains LMA as an aid to airway as an aid to airway. *Indian J of anesthesia*1994;42;262-265.
9. Mata et al-LMA,a more successful method of insertion. *Journal Of Clinical Anesthesia* 1995;7;132-135.
10. Howard G Wakeling et al-LMA:a comparison between two insertion technique. *Anesthesia analgesia* 1997;87;687-90.
11. Solatpour F,Teymourian H,Mohajerani SA et al-Comparison of the incidence of sore throat after rapid sequence intubation with succinylcholine and cis atracurium. *Anesth.pain Med.*2014;4(3);e25111
12. Griffiths JD,Nguyen M,Lau H et al- A prospective randomised comparison of the LMA proseal vs endotracheal tube on severity postoperative pain following gynaecological laparoscopy. *Anaesth. Intensive Care.*2013;41(1);46-50.
13. Reza safaeian,Valliollah Hassani,et al- postoperative respiratory complications of LMA and tracheal tube in ear,nose and throat operations. *Anesth pain med.*2015 aug;5(4);e25111.
14. Figueredo E et al- The Laryngo pharyngeal complaints after use of the laryngeal mask airway. *Can J .Anesthesia* 1997;46;220-5.