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ORIGINAL ARTICLE

Comparison of Postoperative Sore Throat and Hoarseness Between Two Different Sizes of Endotracheal Tube in Females after General Anesthesia

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ABSTRACT

Objective: To compare the frequency of postoperative sore throat and hoarseness between two different sizes of endotracheal tube in females after GA.

Material and Methods: It was comparative analysis study carried in Anaesthesia Department, QIH, Islamabad. During study 200 patients were included (100 patients in each group) according to inclusion criteria. All data was entered in computer software SPSS version 24.0.

Results: Mean age of the patients in Group-A (ETT size 6.0 mm) was 42.2 ± 15 years and 46.7 ± 13.1 in Group-B (ETT size 7.0 mm). The mean duration of surgery among the patients was 57.90 ± 19.8 minutes in Group-A and 77.4 ± 42.2 minutes in Group-B. In Group-A nasogastric tube was used among 36 patients while in Group-B it was used among 25 patients. In both groups, throat pack was not used for any patient. In Group-A, 96 patients and in Group-B, 55 patients had no sore throat. None of the patients in both groups had hoarseness of voice after the procedure.

Conclusion: Study concluded that there was significant difference in the mean score of sore throat when ETT of two different sizes were used. ETT size 6.0mm significantly reduces the incidence of sore throat among females after GA.

Keywords: Incidence, sore throat, endotracheal tube, intubation.

INTRODUCTION

The endotracheal tube is very much crucial to achieve the airway control during GA.[1] Despite rapid advancement in anesthetic techniques,[2] throat complications for example, sore throat and hoarseness after surgery are common complications of GA with tracheal intubation.[3,4] The POST (postoperative sore throat) causes cough while cough after surgery leads to stress at stitch site that increases the pain at operation site[5] and hence further boosts the patient's dissatisfaction and discomfort. Also, it adds to the patient morbidity and can affect patient's activities after leaving the hospital. [6, 7] Hoarseness is recognized to take place after the endotracheal intubation as well. The change in the voice could range from mild hoarseness to entire aphonia reported by patient. The POST incidence could be <90% and that of the hoarseness described in different researches ranges from 4-43 percent. [5]

The sore throat etiology is still not known clearly [8] however it seems to be an inflaming process since tracheal mucosa was found to exude inflaming mediators after the intubation.[9,10] Several influencing factors have been recognized while the most significant one appears to be ETT size utilized, anesthetic spray usage, cuff pressure, female gender, anesthesia duration, succinylcholine usage, surgical positioning, simultaneous usage of the nasogastric tube, oropharyngeal aggressive suctioning and technique to manage the airway (i.e. face mask, ETT, LMA (laryngeal mask airway).[11]

For the prevention of POST, many failed attempts have been done.[12] But utilization of small sized endotracheal tube demonstrated significant reduction in POST incidence[11] and female patients were found having sore throat more complication than the male patients.[13] In a study carried out by Gustavsson et al. reported that POST was prevalent among 29.5% female patients for whom 6.5mm ETT size was used and among 39.5% females for whom 7.0mm ETT was used, such studies have shown that females are more prone to develop sorethroat.[14].[15] One study by Jaensson and coauthors indicated that when comparing the changes between pre- and post-surgery values, difference between cohorts was apparent. The discomfort severity due to sore throat was found more among patients with ETT size 7.0mm (38.8%) when compared with ETT size 6.0mm (18.8%), P-value=0.02. Between the cohorts, no difference was observed in the frequency of hoarseness.[16] A meta-analysis of 3 RCTs and systematic review showed ETT of 6mm reduced the POST incidence in PACU.[17] In a study from Pakistan, the POST incidence was found elevated among patients with ETT size >7.5mm.[18] However, this has not been confirmed by Hammad et al. (2019).[19]

The ETT appropriate size plays an important role in preventing POST; however, few studies have been conducted among Pakistani population regarding endotracheal tube size.[20] Therefore, current study is carried out to compare the frequency of postoperative sore throat and hoarseness between two different sizes of endotracheal tube in females after general anesthesia.

MATERIAL AND METHODS

A comparative cross-sectional study carried out at Department of Anesthesiology, Quaid e Azam International Hospital, Islamabad. The duration of study was 06 months (March11, 2018 to September11, 2018). In this study comparison was made between outcomes of smaller versus standard diameter Endotracheal Tube insertion in female patients undergoing elective surgery. Using convenient sampling, a group of 100 patients in which ETT size 6.0mm were used were compared to another group of 100 patients in which standard 7.0mm ETT was used for anesthesia.

Females included in the study were: aged between 18 to 60 years, elective surgery in supine position, with American society of anesthesiologist physical status I-III, oral intubation with 1 or 2 attempts and anesthesia duration >90 minutes.

Female excluded from the study were: Anesthesia with RSI (rapid sequence induction), use of succinylcholine, ongoing respiratory tract infection and unwilling to participate.

The study was initiated after taking approval from hospital ethical committee. Before the induction of anesthesia, patients were assessed for any complaints of a pre-existing sore throat preoperatively or a history of hoarseness. Postoperatively patients were asked about sore throat in PACU and they rated their symptoms on a scale of 4 points, 1 = no sore throat, 2 = mild, 3 = moderate and 4 = severe sore throat. Hoarseness was evaluated on binary scale (yes/no). Patients were reassessed after 24 hours in the ward or room.

Informed written consent was taken from patients. Female patients receiving general anesthesia were divided into two groups. Those in whom ETT size 6.0 mm was placed considered as Group-A while patients in whom ETT size 7.0 mm was placed considered as Group-B. No lubricants/local anesthetic gel was

applied on ETT. Anesthesia was subsequently maintained along with oxygen, nitrous oxide and isoflurane or sevoflurance. Baseline data recorded were the duration of surgery, age of patient, anticipated difficulty in intubation by using malampatti classification, thyromental distance, use of a nasogastric tube and a throat pack.

All data was entered in statistical packages for social science version 24.0. For quantitative variables such as age and duration of surgery, mean+SD were calculated and for qualitative variable such as sore throat, hoarseness, throat pack and nasogastric tube, frequency & percentages were calculated. Chi-square test was used to test the proportion of hoarseness between two groups. Stratification was done by nasogastric tube and throat pack. P-value <0.05 was considered statistically significant.

RESULTS

Among 100 patients of Group-A (ETT size 6.0 mm), the mean age was 42.2 + 15 years while among 100 patient of Group-B (ETT size 7.0 mm), the mean age was 46.7 + 13.1 years. The mean duration of surgery among Group-A patients was 57.9 ± 19.8 minutes and 77.4 ± 42.2 minutes among Group-B patients. Table-1 exhibits that in Group-A, nasogastric tube was used among 36 (36%) patients while in Group-B, nasogastric tube was used among 25 (25%) patients. Result shows that in both groups, throat pack was not used in any patient. In both groups, majority of the patients had no sore throat (96% in Group-A and 55% in Group-B) while only 4(4%) patients in Group-A and 45(45%) patients in Group-B had mild sore throat. Table indicates that none of the patients in both groups had hoarseness of voice after the procedure.

Table 1: Descriptive statistics of nasogastric tube, throat pack, sore throat and hoarseness of voice

	Group A	Group B
Use of nasogastric tube		
Yes	36 (36.0%)	25 (25.0%)
Use of throat pack		
Yes	0 (0.0%)	0 (0.0%)
Sore throat		
Mild sore	4 (4.0%)	45 (45.0%)
No sore	96 (96.0%)	55 (55.0%)
Hoarseness of voice		
Yes	0 (0.0%)	0 (0.0%)

DISCUSSION

Endotracheal tube plays an essential role during general anesthesia in achieving the airway control. Despite rapid advancement in anesthetic techniques, sore throat and hoarseness are common problems of general anesthesia with tracheal intubation. Several influencing factors have been recognized but the most important factor is endotracheal tube size regarding sore throat and hoarseness. Bearing in mind such complications, current study was carried out at Department of Anesthesiology, Quaid e Azam International Hospital Islamabad. Total 200 patients were divided into two equal groups (100 patients in each group) namely Group-A (ETT size 6.0 mm) and Group-B (ETT size 7.0 mm).

Study revealed that mean age of the patients was 42.2+15 and 47+13.1 years, respectively. But the findings of a study carried out by Jaensson and teammates (2010) highlighted that mean age of the patients treated with ETT size 6.0mm was 45.0+14.5 years and 50.0+15.2 years of patients treated with ETT size 7.0mm.[16]

The findings of our study confirmed that patients treated with ETT size 6.0mm required less surgery time as the mean duration of surgery in Group-A was 57.90+19.8 minute while in Group-B was 77.4+42.2 minutes. But Jaensson and teammates (2010) reported in their study that mean duration of surgery among patients treated with ETT size 6.0mm was 148.5+100.0 minutes and 143.0+54.0 minutes for patients treated with ETT size 7.0mm.[16]

It was found during study that nasogastric tube was used among 36.0% patient in Group-A and it was used among 25.0% patients in Group-B while in remaining proportion of both groups, the nasogastric tube was not used. Study further indicated that throat pack was not used in none of the patients in both groups. However, Jaensson and teammates (2010) confirmed in their study that throat pack was used among 12.5% patients treated with ETT size 6.0mm and among 16.0% patients treated with ETT size 7.0mm.[16]

When the sore throat and hoarseness were assessed among patients, study showed very encouraging results that in Group-A, only 4.0% had mild sore throat but in Group-B, 45.0% had mild sore throat after surgery. Among these patients, no one had hoarseness of voice after the procedure. The findings of our study exhibited better scenario than the study undertaken by Jaensson and fellows (2012) who reported that among patients treated with ETT size 6.0mm, 27.0% had sore throat and 38.0% had hoarseness of voice after surgery. Likewise among patients treated with ETT size 7.0mm, 51.0% had sore throat and 47.0% had hoarseness of voice after surgery. [21] The severity of discomfort was found higher among female patients treated with ETT size 7.0mm than ETT size 6.0mm. Another study performed by Jaensson and teammates (2010) asserted that among patients treated with ETT size 6.0mm, 18.8% had sore throat and 29.0% had hoarseness of voice after 24 hours of surgery. Similarly among patients treated with ETT size 7.0mm, 20.4% had sore throat and 40.8% had hoarseness of voice after 24 hours of surgery. A study was done by Chinachoti and coworkers (2017) elucidated that among patients treated with ETT size 6.5mm, 40.7% had sore throat and 18.5% had hoarseness of voice while among patients treated with ETT size 7.0mm, 41.4% had sore throat and 23.9% had hoarseness of voice.[8] But a study performed by Xu and comrades (2012) exhibited much better scenario that none of the patients in both groups (ETT size 6.0mm and 7.0mm) had post-operative sore throat and hoarseness of voice after 24 hours of surgery.[22] The findings of two studies also confirmed that incidence of sore throat was less among patients treated with ETT size <7.0mm. One study carried out by Ali and collaborator (2021) stated that among patients treated with ETT size 6.5mm, 25.5% had sore throat and among patients treated with ETT size 7.5mm, 60.0% had sore throat. [20] Likewise other study conducted by Gemechu and associates (2017) confirmed that among patients treated with ETT size 6.0mm, only 1.2% had sore throat and among patients treated with ETT size 7.0mm, 10.4% had sore throat.[11]

CONCLUSION

Study concluded that there was significant difference in the mean score of sore throat when endotracheal tubes of two different sizes were used. ETT size 6.0mm significantly reduces the incidence of sore throat among females after surgery. Further studies are required to be conducted on large scale to compare the frequency of postoperative sore throat and hoarseness between two different sizes of endotracheal tube among females after general anesthesia.

REFERENCES

1. Fenta E, Teshome D, Melaku D, Tesfaw A. Incidence and factors associated with postoperative sore throat for patients undergoing surgery under general anesthesia with endotracheal intubation at Debre Tabor General Hospital, North central Ethiopia: a cross-sectional study. Int J Surg Open. 2020 Jun; 25: 1-5.
2. Lee JY, Sim WS, Kim ES, Lee SM, Kim DK, Na YR, et al. Incidence and risk factors of postoperative sore throat after endotracheal intubation in Korean patients. J Int Med Res. 2017 Apr; 45: 744-52.
3. Bagchi D, Mandal MC, Das S, Sahoo T, Basu SR, Sarkar S. Efficacy of intravenous dexamethasone to reduce incidence of postoperative sore throat: A prospective randomized controlled trial. J Anaesthesiol Clin Pharmacol. 2012 Oct; 28: 477-80.
4. Inoue S, Abe R, Tanaka Y, Kawaguchi M. Tracheal intubation by trainees does not alter the incidence or duration of postoperative sore

throat and hoarseness: a teaching hospital-based propensity score analysis. Br J Anaesth. 2015 Sep; 115: 463-9.
5. Sharma S, Bhardwaj V, Sharma S. Dexamethasone to decrease post-anesthesia sore throat (POST) and hoarseness-which is the most effective route: intravenous, topical, or nebulization? A prospective randomized trial. Ain-Shams J Anesthesiol. 2021 Mar; 13: 26.
6. Song JA, Lee S, Choi JI, Lee HG, Park SY, Hwang JY, et al. Effect of a combination of 2% lidocaine jelly and thermally softened endotracheal tube on postoperative sore throat. Anesth Pain Med. 2019 Jan; 14: 158-64.
7. Hameed M, Samad K, Ullah H. Comparison of two supraglottic airway devices on postoperative sore throat in children: a prospective randomized controlled trial. Braz J Anesthesiol. 2020 Jun; 70: 240-7.
8. Chinachoti T, Pojai S, Sooksri N, Rungjindamai C. Risk factors of post-operative sore throat and hoarseness. J Med Assoc Thai. 2017 Aug; 100: 463-8.
9. Won D, Chang JE, Kim H, Lee JM, Oh Y, Hwang JY. Effect of intraoperative neuromuscular blockade on postoperative sore throat and hoarseness in patients undergoing spinal surgery: a prospective observational study. Sci Rep. 2020 Sep; 10: 14810.
10. Ki S, Myoung I, Cheong S, Lim S, Cho K, Kim MH. Effect of dexamethasone gargle, intravenous KSAP dexamethasone, and their combination on postoperative sore throat: a randomized controlled trial. Anesth Pain Med. 2020 Oct; 15: 441-50.
11. Gemechu BM, Gebremedhn EG, Melkie TB. Risk factors for postoperative throat pain after general anaesthesia with endotracheal intubation at the University of Gondar Teaching Hospital, Northwest Ethiopia, 2014. Pan Afr Med J. 2017 Jun; 27: 127.
12. Ranjana R, Sharma A, Singh M, Rajitha J. Comparison of incidence of postoperative sore throat after nebulisation with ketamine, lignocaine and magnesium sulphate- a randomised controlled trial. J Clin Diagn Res. 2020 Jun; 14: UC01-5.
13. Ahmed A, Abbasi S, Ghafoor HB, Ishaq M. Postoperative sore throat after elective surgical procedures. J Ayub Med Coll Abbottabad. 2007 Jun; 19: 12-4.
14. Gustavsson L, Vikman I, Nyström C, Engström Å. Sore throat in women after intubation with 6.5 or 7.0 mm endotracheal tube: a quantitative study. Intensive Crit Care Nurs. 2014 Dec; 30: 318-24.
15. Jaensson M, Gupta A, Nilsson UG. Gender differences in risk factors for airway symptoms following tracheal intubation. Acta Anaesthesiol Scand. 2012 Nov; 56: 1306-13.
16. Jaensson M, Olowsson LL, Nilsson U. Endotracheal tube size and sore throat following surgery: a randomized-controlled study. Acta Anaesthesiol Scand. 2010 Feb; 54: 147-53.
17. Hu B, Bao R, Wang X, Liu S, Tao T, Xie Q, et al. The size of endotracheal tube and sore throat after surgery: a systematic review and meta-analysis. PLoS One. 2013 Oct; 8: e74467.
18. Kadri IA, Khanzada TW, Samad A, Memon W. Post-thyroidectomy sore throat: a common problem. Pak J Med Sci. 2009 Jun; 25: 408-12.
19. Hammad Y, Shallik N, Sadek M, Feki A, Elmoghazy W, et al. Effects of endotracheal tube size and cuff pressure on the incidence of postoperative sore throat: comparison between three facilities. South Clin Ist Euras. 2019 Oct; 30: 306-9.
20. Ali S, Khan A, Ashfaq A. Comparison of two different sizes of endotracheal tracheal tube for postoperative sore throat in breast cancer patients undergoing surgeries. Cureus. 2021 Jan; 13: e12896.
21. Jaensson M, Gupta A, Nilsson UG. Risk factors for development of postoperative sore throat and hoarseness after endotracheal intubation in women: a secondary analysis. AANA J. 2012 Aug; 80: S67-73.
22. Xu YJ, Wang SL, Ren Y, Zhu Y, Tan ZM. A smaller endotracheal tube combined with intravenous lidocaine decreases post-operative sore throat - a randomized controlled trial. Acta Anaesthesiol Scand. 2012 Nov; 56: 1314-20.