

Assessment of Efficacy of Ketamine Nebulization on Reduction of Incidence and Severity of Postoperative Sore Throat Due To Tracheal Intubation

Mujahid Masood Khan Sherwani¹

¹Assistant Professor, Department of Anaesthesia, Teerthanker Mahaveer Medical College, TMU, Moradabad, India.

Abstract

Background: Aim: To assess efficacy of ketamine nebulization on reduction of incidence and severity of postoperative sore throat due to tracheal intubation. **Subjects and Methods:** One hundred twenty patients between 18-70 years of age of any genders were randomly assigned to two groups. Group I received ketamine 50 mg (1.0 ml) in combination with 4.0 ml saline nebulization for 15 minutes and group II received 5.0 ml saline nebulisation. Each group comprised of 60 patients. After extubating, and at 2, 4, 6, 8, 12, and 24 hours post-operatively, POST monitoring was performed. **Results:** Group I comprised of 32 male and 28 female and group II 30 male and 30 female. The duration of surgery was 98.5 minutes in group I and 99.2 minutes in group II. ET tube size was 7.82 in group I and 7.13 mm in group II. Intraoperative cuff pressure was 23.5 cm of H₂O in group I and 23.8 cm of H₂O in group II. Incidence of postoperative sore throat (POST) at 0 hours was seen in 1 in group I and 7 in group II, at 2 hours in 7 in group I and 12 in group II, at 4 hours in 11 in group I and 28 in group II, at 6 hours in 7 in group I and 16 in group II, at 12 hours in 1 in group I and 9 in group II and at 24 hours in 2 in group II. **Conclusion:** Preoperative ketamine nebulization found to be effective method for reducing the occurrence of post-operative sore throat (POST) in patients involving GA with endotracheal intubation.

Keywords: ketamine nebulization, postoperative sore throat, general anaesthesia.

Corresponding Author: Dr. Mujahid Masood Khan Sherwani, Assistant Professor, Department of Anaesthesia, Teerthanker Mahaveer Medical College, TMU, Moradabad, Uttar Pradesh, India.

Received: August 2019

Accepted: November 2019

Introduction

The term "sore throat" refers to a collection of signs and symptoms such as hoarseness, coughing, laryngitis, tracheitis, and odynophagia that develop as a result of endotracheal intubation under general anaesthesia^[1] Postoperative sore throat (POST) is one of the most common complications after endotracheal intubation, which usually lingers for 12-24 hours after the operation.^[2] The incidence is estimated to be of 18-65% in different studies. Factors contributing to development of POST include trauma to pharyngolaryngeal mucosa from laryngoscopy, placement of nasogastric tube or oral suctioning.^[3]

It is noted that N-methyl-d-aspartate (NMDA) has a role in nociception and inflammation. Ketamine, an NMDA receptor antagonist, has been used for decreasing POST because of its anti-nociceptive and anti-inflammatory action, as gargle as well as in nebulized form.^[4] However, nebulized ketamine is better tolerated in patients due to many reasons such as: It saves the patient from the bitter taste of ketamine, also much lesser volume is needed as against larger volumes required for gargle.^[5] Ketamine nebulization has a few advantages over gargle: It spares the patient from the bitter

taste of ketamine much smaller volume is required as opposed to larger volumes required for gargle with risk of aspiration if accidentally swallowed.^[6,7] Considering this, the present study was planned to assess efficacy of ketamine nebulization on reduction of incidence and severity of postoperative sore throat due to tracheal intubation.

Subjects and Methods

After considering the utility of the study and obtaining approval from ethical review committee of the institute, we selected one hundred twenty patients between 18-70 years of age of any genders.

Demographic profile of each patient was entered in case sheet proforma. Patients were randomly assigned to two groups. Each group comprised of 60 patients. Group I received ketamine 50 mg (1.0 ml) in combination with 4.0 ml saline nebulization for 15 minutes and group II received 5.0 ml saline nebulisation. General Anesthesia was induced 10 minutes after nebulization was completed. After extubating, and at 2, 4, 6, 8, 12, and 24 hours post-operatively, POST monitoring was performed. POST was graded on a four-point scale (0–3); 0 = no sore throat; 1 =

mild sore throat (complains of sore throat only on questioning); 2 = moderate sore throat (complains of sore throat on his/her own); 3 = severe sore throat (change of voice or hoarseness, associated with severe throat pain). The results were compiled and subjected for statistical analysis using Mann Whitney U test. P value less than 0.05 was set significant.

Results

Table 1: Patients distribution

Groups	Group I	Group II
Agent	ketamine 50 mg (1.0 ml) +4.0 ml saline nebulization	5.0 ml saline nebulisation
M:F	32:28	30:30

Group I comprised of 32 male and 28 female and group II 30 male and 30 female [Table 1].

Table 2: Patient characteristics

Characteristics	Group I	Group II	P value
Duration of surgery (mins)	98.5	99.2	0.82
ET Tube size (in mm)	7.82	7.13	0.90
Intraoperative cuff pressure (cm of H ₂ O)	23.5	23.8	0.72

Duration of surgery was 98.5 minutes in group I and 99.2 minutes in group II. ET tube size was 7.82 mm in group I and 7.13 mm in group II. Intraoperative cuff pressure was 23.5 cm of H₂O in group I and 23.8 cm of H₂O in group II. The difference was significant (P<0.05) [Table 2].

Table 3: Incidence of postoperative sore throat

Time of incidence (hours)	Group I	Group II	P value
0	1	7	0.01
2	7	12	0.05
4	11	28	0.12
6	7	16	0.03
12	1	9	0.01
24	0	2	0.72

Incidence of postoperative sore throat (POST) at 0 hours was seen in 1 in group I and 7 in group II, at 2 hours in 7 in group I and 12 in group II, at 4 hours in 11 in group I and 28 in group II, at 6 hours in 7 in group I and 16 in group II, at 12 hours in 1 in group I and 9 in group II and at 24 hours in 2 in group II. A significant difference in occurrence of POST was seen between both groups (P<0.05) [Table 3].

Discussion

Post-operative sore throat (POST) occurs in 21-65% of patients receiving general anaesthesia (GA) with tracheal intubation.^[8,9] Though considered as a minor complication, but it may cause significant post-operative morbidity and patient dissatisfaction.^[10,11] Various non-pharmacological and pharmacological trials have been used for attenuating POST with no proven single modality.^[12] In this prospective, observational study we assessed efficacy of ketamine nebulization on reduction of incidence and severity of postoperative sore throat due to tracheal intubation.

Our results revealed that group I comprised of 32 male and 28 female and group II 30 male and 30 female. Ahuja et al.^[13] enrolled 100 patients undergoing surgery under general anaesthesia (GA) which were randomised into two groups; group saline (S) received saline nebulisation 5.0 ml and group ketamine (K) received ketamine 50 mg (1.0 ml) with 4.0 ml of saline nebulisation for 15 minutes. The POST and haemodynamic monitoring were done pre-nebulization, pre-induction, on reaching post-anaesthesia care unit, and at 2, 4, 6, 8, 12 and 24 h post-operatively. The overall incidence of POST was 33%; 23 patients (46%) in saline and 10 patients (20%) in ketamine group experienced POST. The use of ketamine nebulization attenuated POST at 2 hours and 4 hours post-operatively. The primary outcome was incidence of POST at 4 hours; 13 patients in group S versus 4 patients in group K experienced POST at 4 hours. The moderate sore throat occurred in 6 patients in group S and none in group K at 2 hours, post-operatively.

We observed that duration of surgery was 98.5 minutes in group I and 99.2 minutes in group II. ET tube size was 7.82 in group I and 7.13 mm in group II. Intraoperative cuff pressure was 23.5 cm of H₂O in group I and 23.8 cm of H₂O in group II. Thomas et al.^[14] evaluated the efficacy of nebulized ketamine in decreasing POST. 96 patients of either sex undergoing general anaesthesia (GA) with tracheal intubation were randomized into two groups; Group 1 received ketamine 50 mg (1.0 ml) with 4.0 ml of saline nebulization, while Group 2 received saline nebulization 5.0 ml for 15 min. The overall incidence of POST in this study was 25%: POST was experienced by 7 patients (14.6%) in ketamine and 17 patients (35.4%) in saline group. There was statistically significant reduction in the incidence of POST in ketamine group when compared to saline, at 2, 4, 6, 12, and 24 hours postoperatively. Severity of sore throat was also higher in saline group when compared to ketamine at 4 hours and 6 hours post-extubation.

Our results showed that incidence of postoperative sore throat (POST) at 0 hours was seen in 1 in group I and 7 in group II, at 2 hours in 7 in group I and 12 in group II, at 4 hours in 11 in group I and 28 in group II, at 6 hours in 7 in group I and 16 in group II, at 12 hours in 1 in group I and 9 in group II and at 24 hours in 2 in group II. Chan et al.^[15] examined intraoperative serum ketamine levels in their trial employing ketamine gargle to reduce POST. They demonstrated low serum ketamine levels and suggested that ketamine's topical action resulted in POST attenuation rather than a systemic effect.

Conclusion

Preoperative ketamine nebulization found to be effective method for reducing the occurrence of post-operative sore throat (POST) in patients involving GA with endotracheal intubation.

References

1. Junchi Ogata, Kouichiro Minami, Takafumi Horishita et al. Gargling with Sodium Azulene Sulfonate Reduces the Postoperative Sore Throat After Intubation of the Trachea; Anesthesia & Analgesia: July 2005; 290-293.

2. Thomas S, Beevi S. Dexamethasone reduces the severity of postoperative sore throat. *Can J Anaesth* 2007; 54:897- 901.
3. Asif Kazami, Afshini Amini. The effect of Betamethasone gel in reducing sore throat, cough, and hoarseness after laryngo-tracheal intubation. *M.E.J Anesth* 2007; 19 (1): 1-5.
4. Christensen AM, Willemoes-Larsen H, Lundby L, Jakobsen KB. Postoperative throat complaints after tracheal intubation. *Br J Anaesth*. 1994;73(6):786-7.
5. Macario A, Weinger M, Carney S, Kim A. Which clinical anesthesia outcomes are important to avoid? The perspective of patients. *Anesth Analg*. 1999;89(3):652-8.
6. Kori K, Muratani T, Tatsumi S, Minami T. Influence of endotracheal tube cuff lubrication on postoperative sore throat and hoarseness. *Masui*. 2009;58(3):342-5.
7. SMehrotra, Kumar N, Khurana G, Bist SS. Post-Operative Sore Throat: Incidence after nebulization with Ketamine, Lidocaine and Budesonide. *Int J Med Sci Clin Invention*. 2017;4(6).
8. Kalil DM, Silvestro LS, Austin PN. Novel preoperative pharmacologic methods of preventing postoperative sore throat due to tracheal intubation. *AANA J*. 2014;82(3):188-97.
9. Jain S, Barasker SK. A comparative study of preoperative ketamine and MgSO₄ nebulisation for incidence of post-operative sore throat after endotracheal intubation. *Int J Contemp Med Res*. 2017;4(6):1356-9.
10. Al-Qahtani AS, Messahel FM: Quality improvement in anesthetic practice- incidence of sore throat after using small tracheal tube. *Middle East J Anesthesiol*; 2005, 18:179-83. 1
11. Hirota K, Lambert DG. Ketamine: new uses for an old drug? *Br J Anaesth*. 2011;107(2):123-6.
12. Rudra A, Ray S, Chatterjee S, Ahmed A, Ghosh S. Gargling with ketamine attenuates the postoperative sore throat. *Indian J Anaesth*. 2009;53(1):40-3.
13. Ahuja V, Mitra S, Sarma R. Nebulized ketamine decreases incidence and severity of post-operative sore throat. *Indian journal of anaesthesia*. 2015 Jan;59(1):37.
14. Thomas D, Bejoy R, Zabrin N, Beevi S. Preoperative ketamine nebulization attenuates the incidence and severity of postoperative sore throat: A randomized controlled clinical trial. *Saudi J Anaesth*. 2018;12(3):440-5.
15. Chan L, Lee ML, Lo YL. Postoperative sore throat and ketamine gargle. *Br J Anaesth*. 2010;105(1):97.

Copyright: © the author(s), publisher. Academia Anesthesiologica International is an Official Publication of "Society for Health Care & Research Development". It is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Sherwani MMK. Assessment of efficacy of ketamine nebulization on reduction of incidence and severity of postoperative sore throat due to tracheal intubation. *Acad. Anesthesiol. Int*. 2019;4(2):366-368.

DOI: [dx.doi.org/10.21276/aan.2019.4.2.83](https://doi.org/10.21276/aan.2019.4.2.83)

Source of Support: Nil, **Conflict of Interest:** None declared.