A COMPARATIVE ANALYSIS FOR REDUCTION OF POST-SURGICAL SORE THROAT BY APPLYING OF KETAMINE-NEBULIZATION & BETAMETHASONE-GEL OVER THE ENDO-TRACHEAL TUBE CUFF

1Dr. Agrawal Supriya, 2Dr. Shanim Atahar, 3Dr. Sharma Vidushi

1Assistant Professor Dept. of Anesthesiology K D Medical College, Hospital & Research Centre, Mathur, Uttar Pradesh India  
2Assistant Professor Dept. of Anesthesiology K D Medical College, Hospital & Research Centre, Mathur, Uttar Pradesh India  
3Assistant Professor Dept. of Anesthesiology K D Medical College, Hospital & Research Centre, Mathur, Uttar Pradesh India

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Corresponding author: Dr. Shamim Atahar  
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Abstract

Background: In general anaesthesia (GA), endo-tracheal -intubation is required to control respiration & to protect the airway. The commonest locations of injury while intubation are the larynx & trachea, which typically manifest as regional pain, inflammation & even necrosis.

Aims & objectives: This research was carried out to contrast the efficaciousness of ketamine-nebulization & betamethasone-gel on the cuff of the endo-tracheal -tube to alleviate post-surgical throat pain (POST).

Materials & methods: This is a randomized, prospective research assessing the efficaciousness of betamethasone-gel & lignocaine-jelly ketamine-nebulisation applied over the endo-tracheal -tube cuff to decrease post-surgical sore throat nebulisation (POST). The study subjects were divided randomly into ketamine (category K), betamethasone (category B) & lignocaine category (category L). Study subjects were observed immediately after extubation (0 hr), 2 hrs, 6 hrs, 12 hrs & 24 hours after the post-surgical time for POST, which was rated on a four-point ranking.

Results: In this research, the total occurrence of POST was 30 %. Out of this, POST occurred only in 20 % of study subjects in the (K) category, 23 % of study subjects in the (B) category, contrasted to 47% in the (L) (control) category. The occurrence of POST at 0 hr, 2 hrs, 6 hrs, 12 hrs, 24 hours was 10 %, 10 %, 17 %, 10 % & 7 % respectively in the ketamine-nebulisation category.

Conclusion: This research culminates that pre-surgical nebulization with ketamine & betamethasone-gel applied over the cuff of the endo-tracheal -tube is equally successful in reducing POST.

Key Word: ketamine-nebulization, betamethasone-gel, lignocaine, Endo-tracheal -intubation

Introduction

In general anaesthesia, endo-tracheal -intubation is required to control respiration & to protect the airway. While the cornerstone of contemporary anesthetic practice & critical treatment has remained endo-tracheal - intubation, it is with complications. There were several levels of airway damage eventuating in post-surgical sore throat (POST), speech hoarseness, cough & pain in almost all study subjects who were intubated for long-lasting or short-lasting surgical intervention. The commonest locations of injury while intubation are the larynx & trachea, which typically manifest as regional pain, inflammation & even necrosis. In 21-65 % of study subjects undergoing general anaesthesia (GA) with endo-tracheal -intubation, post-surgical sore throat (POST) occurs. It can cause substantial post-surgical morbidity & patient discomfort, albeit regarded as a minor complication. The occurrence of these complications was altered by numerous factors, including age, season, h/o smoking, individual with hyper-reactive airways, anesthetic drugs & gases used in GA, number of studies & trauma while intubation, length of intubation, size of the endo-tracheal -tube & its kind, kind of cuff & its size, surgical location, ketamine nebulization & lidocaine applying, steroid nebulization & lidocaine applying. Ketamine is an NMDA receptor antagonist with a primary central nervous system location of action, & parts of the limbic system show its peripheral effect when used by the nasal, gargle & rectal routes. Regional inflammation & even the peripheral analgesic impact of ketamine are attenuated by the topical effect of ketamine-nebulization.

Aims & Objectives

To delisting the role of nebulized ketamine for POST relief in study subjects undergoing surgical intervention under endo-tracheal -intubation general anaesthesia. To assess the function of Betamethasone-gel applied to POST relief over the endo-tracheal -tube cuff in study subjects undergoing surgical intervention under endo-tracheal -intubation general anaesthesia & to contrast it with Ketamine-nebulization.
Materials & Methods

This is a randomized controlled prospective research of 180 study subjects in the 18-70-year age category of either gender with American Society of Anesthesiologists stage I & II physical status & mallampati stage 1 & 2 undergoing GA surgical intervention lasting more than 1 hour. All 180 study subjects are randomized into three categories of 60 each, after institutional ethical committee clearance & written informed consent.

Results

Table 1: Demographic data

|                      | (K) category (n=60) | (B) category (n=60) | (L) category (n=60) |
|----------------------|---------------------|---------------------|---------------------|
| Mean age in years ± SD | 38.4 ± 10.62        | 40.6 ± 10.78        | 39.4 ± 8.54         |
| Min age (years)      | 19                  | 20                  | 20                  |
| Max age (years)      | 61                  | 65                  | 63                  |
| Gender Distribution  |                     |                     |                     |
| Mens                 | 26 (43 %)           | 28 (47 %)           | 30 (50 %)           |
| Women                | 34 (57 %)           | 32 (53 %)           | 30 (50 %)           |
| ASA stage            |                     |                     |                     |
| ASA 1                | 38 (63 %)           | 38 (63 %)           | 42 (70 %)           |
| ASA 2                | 22 (37 %)           | 22 (37 %)           | 18 (30 %)           |

The length of surgical intervention was found in both categories to be equivalent to the p value being > 0.05, which is not important. The average occurrence of POST in this research is 30 %. Just 20 % of the study subjects in the category (K) & 23 % of the study subjects in the category (B) had POST, contrasted with 47 % in the category (L). In relation to the L category, there is a substantial reduction in the occurrence of POST in the K & B category (P<0.05).

Table 2: POST occurrence & intensity at all periods of time

| Hrs | POST Grading | Category (K) n= 60 | Category (B) n= 60 | Category (L) n= 60 |
|-----|--------------|---------------------|---------------------|---------------------|
| 0   | 0            | 54 (90%)            | 54 (90%)            | 40 (67%)            |
| 1   | 6 (10%)      | 6 (10%)             | 12 (20%)            |                     |
| 2   | 0            | 0                   | 8 (13%)             |                     |
| 2nd | 0            | 54 (90%)            | 50 (83%)            | 36 (60%)            |
| 1   | 6 (10%)      | 10 (17%)            | 14 (23%)            |                     |
| 2   | 0            | 0                   | 10 (17%)            |                     |
| 6th | 0            | 50 (83%)            | 52 (87%)            | 32 (53%)            |
| 1   | 8 (13%)      | 4 (7%)              | 22 (37%)            |                     |
| 2   | 2 (3%)       | 4 (7%)              | 6 (10%)             |                     |
| 12th| 0            | 54 (90%)            | 54 (90%)            | 36 (60%)            |
| 1   | 4 (7%)       | 6 (10%)             | 16 (27%)            |                     |
| 2   | 2 (3%)       | 0                   | 8 (13%)             |                     |
| 24th| 0            | 56 (93%)            | 56 (93%)            | 38 (63%)            |
| 1   | 4 (7%)       | 4 (7%)              | 16 (27%)            |                     |
| 2   | 0            | 0                   | 6 (10%)             |                     |

None of the study subjects in all three classes had serious sore throat disease (stage 3). In the category (K) & the category (B), the frequency & intensity of POST at all time intervals was remarkably low contrasted to the category (L) (p<0.05). There is no statistical difference in the reduction of occurrence & severity of POST at all time intervals between the K category & the B category. In all three categories, none of the study subjects experienced significant throat pain. Study subjects remained haemodynamically stable in all three classes.

Discussion

After tracheal intubation, post-surgical sore throat, cough & hoarseness of the voice are frequently recurrent, painful sequelae. According to the available literature, the prevalence of these complications has been recorded at around 20 % - 70 %. The wide variance in these statistics is possibly due to various abilities & procedures of anesthetists & variations in the concept of sore throat between individual anesthetists & study subjects11-14. Post-surgically, it seems most likely that the symptoms are the due to mucosal damage triggered by the airway
instrumentation procedure or the unpleasant effects of a foreign object with the accompanying inflammation. A variety of pharmacological & non-pharmacological maneuvers are frequently used to relieve, with varying levels of efficaciousness, post-surgical sore throat, cough, & speech hoarseness. Such non-pharmacological steps have been taken to avoid these complications are narrow endo-tracheal tubes, lubricating the endo-tracheal tubes with water soluble jelly, cautious airway instrumentation, intubation after complete relaxation, reducing intracuff pressure, gentle oro-pharyngeal suction & extubation when the tracheal tube cuff is completely deflated. The total occurrence of POST in this research is 30 %, of which just 20 % of study subjects in the ketamine category had POST, 23 % of study subjects in the betamethasone category contrasted to 47 % in the lignocaine category (control). A research conducted by Ahuja et al recorded an average POST occurrence of 33 % & 20 % in the ketamine community. These results are consistent with our research. In all 3 classes, the demographic variables are comparable. This research is comparable to our research in which we used an anti-inflammatory factor, a POST reduction steroid called betamethasone-gel. A randomized, placebo-controlled, double-blinded research was conducted by Thomas et al in 2007 culminated that the frequency & severity of POST was decreased by steroid IV dexamethasone, which is equivalent to the current research. A double-blinded clinical trial was performed by Asif Kazemi et al & the current research findings are in accordance with this research in which 77 % of betamethasone-gel study subjects had POST relief contrasted to 53 % in the Lignocaine community. After endo-tracheal -intubation, regional anesthetic factors such as Lidocaine jelly or spray are considered to be ineffectual in avoiding pain in the throat. These factors are known to limit tracheal mucosal damage & prevent cough, & as they lack anti-inflammatory effects, they cannot be successful in preventing sore throat. Studies have also shown that regional anesthetic jelly applying restricts the possible damage to the tracheal mucosa due to its lubricating properties that suppress the bucking of the tracheal channel. There are a few restrictions of our research. To explain the sedative effect of ketamine, no standardized sedation ranking was used. Monitoring of endo-tracheal -tube cuff pressure was not performed.

Conclusion

Equally efficacious in minimizing POST is ketamine-nebulisation (50 mg in 5 ml) Pre-surgically & the applying of 3 ml of betamethasone-gel over the endo-tracheal -tube cuff. Pre-surgical nebulisation with ketamine & betamethasone-gel applied over the cuff of the endo-tracheal -tube is preferable to applying of lignocaine-jelly over the cuff of the endo-tracheal -tube to decrease post-surgical sore throat. The research believes that the applying of betamethasone-gel over the endo-tracheal -tube cuff between ketamine-nebulisation & the applying of betamethasone-gel over the endo-tracheal -tube cuff is cost-efficacious, readily accessible, simple to apply & economical. It is also recommended that post-surgical throat pain be decreased.

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