



A COMPARISON OF EFFECT OF NEBULISED KETAMINE AND NEBULISED MAGNESIUM SULPHATE IN REDUCTION OF INCIDENCE AND SEVERITY OF POSTOPERATIVE SORE THROAT - A PROSPECTIVE RANDOMIZED DOUBLE BLINDED STUDY

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ABSTRACT

Introduction: Postoperative sore throat (POST) is a common occurrence following general anesthesia with endotracheal intubation. The incidence of POST is estimated to be 21%-65% in various studies.

Irritation and inflammation of the air way are considered to be the cause of POST. Although considered a minor and self limiting complication, it may cause a significant patient morbidity, dissatisfaction and increased the length of duration of hospital stay. Various pharmacological and non pharmacological methods have been tried to decrease POST with varying success rates. Among the interventions, the use of ketamine gargle or lozenges has highest success rates, but the problem with this is the bitter taste of the drug and the risk of aspiration, so aerosol route of drug administration gained popularity among the anesthesiologists with good acceptance from the patients. It is known that N-methyl-D-aspartate (NMDA) receptors have a role in nociception and inflammation. Hence, this study is aimed at using the aerosol route of magnesium sulphate and ketamine and to find it effectiveness in preventing POST.

Aim Of The Study: To evaluate the effect of nebulized ketamine and nebulized magnesium sulphate for attenuation of postoperative sore throat in patients undergoing surgeries under general anesthesia with tracheal intubation.

Materials And Methods: This study was done in the Department of Anesthesiology in collaboration with the Department of Surgery in Kanyakumari Government Medical College from January 2019 to December 2019. Patient planned for surgery under general anesthesia except head, neck & ENT surgeries were selected and randomized into two groups (35 each). Each group received nebulisation for 15 min before induction of general anaesthesia. Group M: Nebulization with 500mg magnesium sulphate in 5ml NS. Group K: Nebulization with 50mg ketamine in 5ml NS. The Parameters related to the study such as duration of laryngoscopy, time taken to intubate, duration of surgery, number of attempts to intubate were recorded. Incidence and severity of sore throat were assessed by four point scale. Incidence of sore throat is assessed for 24 hours. Complication were recorded.

Results: We found that the demographic parameters were comparable and statistically insignificant. The mean duration of laryngoscopy difference between the two groups Group M - 24.54 ± 1.12 seconds and Group K - 24.49 ± 1.15 seconds was not statistically significant P= 0.834 (P>0.05). The mean time taken to intubate in Group M - 27.54 ± 1.12 seconds and Group K - 27.54 ± 1.12 seconds was not statistically significant with P=1.000 respectively (P>0.05). The mean duration of surgery in Group M - 90.71 ± 15.67 minutes and the Group K - 88.20 ± 16.53 minutes between the two groups was not statistically significant P= 0.516 (P>0.05). The mean difference of number of attempts taken to intubate between the two groups was statistically insignificant P=0.771 (P>0.05). The overall incidence of sore throat in Group M was 91% and in Group B was 34%. The severity of sore throat between Group M and Group K is statistically significant at 2, 4, 6 hrs at grade 1 and grade 2.

Conclusion: On the basis of our result, we can suggest that the use of perioperative ketamine nebulization when compared magnesium sulphate nebulization reduces the incidence and severity of post-operative sore throat at 4th and 6th hour during postoperative period in patients who had received general anesthesia with tracheal intubation.

KEYWORDS :

INTRODUCTION:

Postoperative sore throat (POST) is a common occurrence following general anesthesia with endotracheal intubation. The incidence of POST is estimated to be 21%-65% in various studies. POST remains the eight most undesirable postoperative event. Irritation and inflammation of the air way are considered to be the cause of POST. Although considered a minor and self-limiting complication, it may cause a significant patient morbidity, dissatisfaction and increased the length of duration of hospital stay.

Various pharmacological and non-pharmacological methods have been tried to decrease POST with varying success rates. Among the interventions, the use of ketamine gargle or lozenges has highest success rates, but the problem with this is the bitter taste of the drug and the risk of aspiration, so aerosol route of drug administration gained popularity among the anesthesiologists with good acceptance from the patients. It is known that N-methyl-D-aspartate (NMDA) receptors have a role in nociception and inflammation. NMDA receptors are found in central nervous system, peripheral nervous system and spinal cord. The available data suggest that both have potential role in reducing POST. Hence, this study is aimed at using the aerosol route of magnesium sulphate and ketamine and to find it effectiveness in

preventing POST.

AIM OF THE STUDY:

To evaluate the effect of nebulized ketamine and nebulized magnesium sulphate for attenuation of postoperative sore throat in patients undergoing surgeries under general anesthesia with tracheal intubation.

MATERIALS AND METHODS:

This study was done in the Department of Anesthesiology in collaboration with the Department of General Surgery in Kanyakumari Government Medical College during the period of January 2019 to December 2019 after approval from the institutional ethical committee and the Department of General Surgery and with written informed consent from the patients.

Sample Size: Sample size formula, $n = 2 \times Z^2 \times pq \div d^2$

Blinding: Double blinded study

Randomization: The patients were allocated to two group (35 each) randomly by the closed envelope technique.

Group Allocation: Group M: Nebulization with 500mg magnesium sulphate in 5ml NS.

Group K: Nebulization with 50mg ketamine in 5ml NS

Inclusion Criteria: Age 16-65 yrs, BMI < 30

Exclusion Criteria:

Patient's refusal, Oral cavity, nasopharynx, larynx And neck regions surgeries, Surgeries requiring prone position, surgeries lasting for more than 3hrs, H/O preop sore throat, Common cold And recent NSAIDS use, Asthma/COPD, >1 Attempt at intubation and traumatic intubation, Patient undergoing thyroid surgeries.

Intervention:

All the patients were kept nil per oral for 8 hours. Patient premedicated with oral alprazolam 0.5mg and ranitidine 150mg on the night before and on morning of surgery. Baseline vital parameters were recorded. 15 min before the induction of GA, patients were nebulized with the study drug magnesium sulphate or ketamine depend on group selected by randomization with a wall mounted oxygen source at 10L/MIN (50 psi pressure). Patient induced, post surgery patient was extubated.

Parameters Monitored:

Vital parameters pre nebulization, post nebulization & preinduction were recorded. Duration of laryngoscopy, time taken to intubate, duration of surgery, number of attempts to intubate were recorded. Incidence and severity of sore throat were assessed by four point scale. Incidence of sore throat is assessed for 24 hours, Complication if any

Primary Outcome:

Incidence and Severity of postoperative sore throat (POST)

Secondary Outcome: Complication if any

Definition of Study Parameters:

Duration Of Surgery :

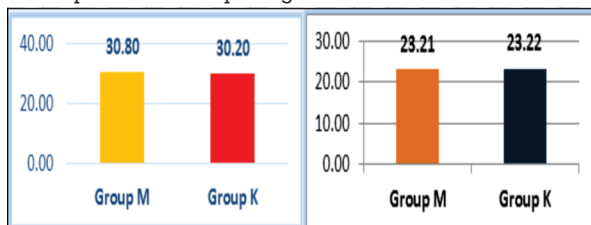
The time interval between the start of giving premedication to the end of extubation.

Severity Of POST :

assessed by a four point scale (0-3) as follows: 0- No sore throat
1 - Mild sore throat (complains of sore throat only on asking),
2- Moderate sore throat (complains of sore throat on his/her own),
3- Severe sore throat (changes of voice or hoarseness, associated with throat pain)

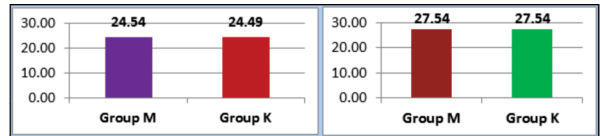
Statistical Analysis:

The demographic data were expressed as means and standard deviation. Duration of laryngoscopy, time taken to intubate, and duration of surgery were expressed as means and standard deviation and significance were assessed using the Mann-Whitney test. The number attempts to intubate was assessed using Chi-square test. The hemodynamic variables such as HR, SBP, and DBP were expressed as mean and standard deviation and significance were assessed using paired t-test and for SBP using Wilcoxon signed-rank test. The incidence and severity of sore throat were assessed using Chi-square test. The above statistical procedures were undertaken with help of the statistical package IBM.SPSS statistics-20.



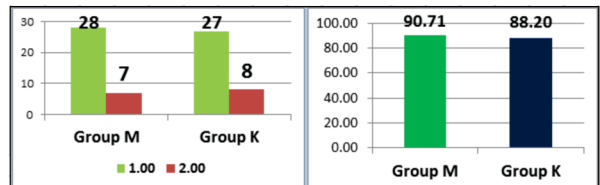
Graph 1: Comparison of Age

Graph 2: Comparison of BMI



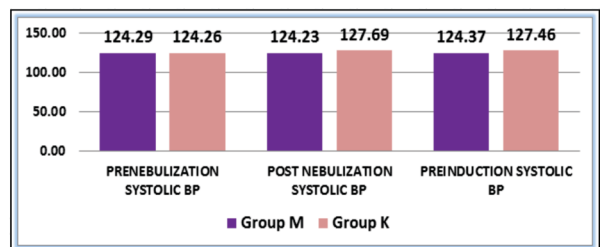
Graph 3: Duration Of Laryngoscopy

Graph 4: Time Taken To Intubate

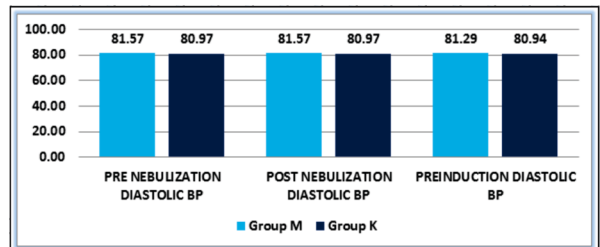


Graph 5: Number Of Attempts Taken To Intubate

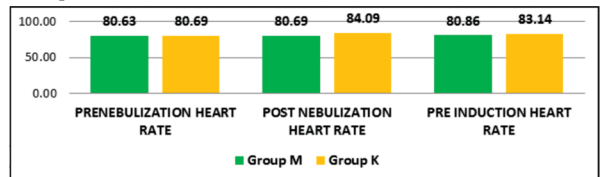
Graph 6: Duration Of Surgery



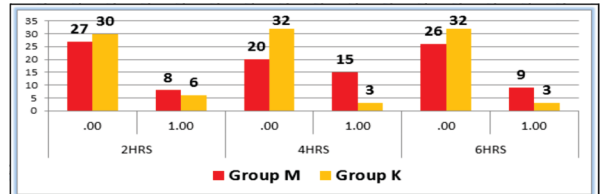
Graph 7: Comparison Of Pre Nebulization, Post Nebulization And Pre Induction Systolic Blood Pressure Between The Two Groups



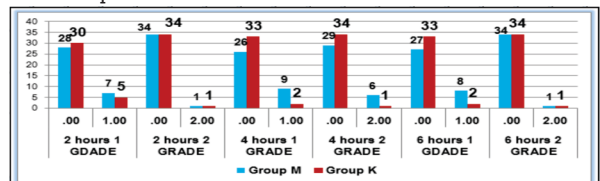
Graph 8: Comparison Of Pre Nebulization, Post Nebulization And Pre Induction Diastolic Blood Pressure Between The Two Groups



Graph 9: Comparison Of Pre Nebulization, Post Nebulization And Pre Induction Heart Rate Between Two Groups



Graph 7: Comparison Of Incidence Of Sore Throat Among Two Groups At Different Time Intervals



Graph 8: Comparison Of Severity Of Sore Throat At Different Time Intervals Between The Two Groups

DISCUSSION:

POST though a self limiting complication following general anaesthesia with endotracheal intubation, it continues to be an important concern for surgical patients. Some of preventive interventions for POST include beclomethasone gel, magnesium sulfate gargle, ketamine gargle, ketamine nebulization, magnesium sulfate nebulization, lidocaine spray, smaller size endotracheal tubes, minimizing cuff pressure to <20 mmHg, and minimizing laryngoscopy attempts. Among the interventions, the use of ketamine gargle or lozenges has the highest success rates. The problem with gargle or lozenges is the bitter taste of the drug and the risk of aspiration while gargling which may lead to serious complications. Hence, the administration of the drug through aerosol route gained popularity with good acceptance from the patients. Nebulization is inexpensive, quick, convenient, and easy to administer also, which made this, the route of choice. In my study, the effectiveness of ketamine and magnesium sulfate nebulization on POST were compared. The demographic data (age, sex, weight, height, and BMI) were comparable between the groups. The duration of laryngoscopy, time taken to intubate, duration of surgery, and number attempts taken to intubate were comparable between the two groups. The hemodynamic parameters such as HR, SBP, and DBP during pre nebulization were 80.63 ± 2.24 beats per minute (bpm), 124.29 ± 2.07 mmHg, and 81.57 ± 2.93 mmHg in Group M and 80.69 ± 2.25 bpm, 124.26 ± 2.08 mmHg, and 80.97 ± 1.15 mmHg in Group K, respectively. During post nebulization HR, SBP and DBP were 80.69 ± 2.25 bpm, 124.23 ± 2.10 mmHg, and 81.57 ± 2.93 mmHg in Group M and 84.09 ± 1.70 bpm, 127.69 ± 2.34 mmHg, and 80.97 ± 1.15 mmHg in Group K, respectively. During Pre induction the HR, SBP, and DBP were 80.86 ± 2.33 bpm, 124.37 ± 2.34 mmHg, and 81.29 ± 2.26 mmHg in Group M and 83.14 ± 2.13 bpm, 127.46 ± 1.65 mmHg, and 80.94 ± 1.19 mmHg in Group K, respectively. There was statistically significant ($P < 0.05$) increase in HR and SBP in Group K when compared to Group M during post nebulization and pre induction comparing to pre nebulization. The overall incidence of sore throat in Group A was 91% and in Group B was 34%. None of the patients complained of sore throat in both the groups in the immediate postoperative period at 0 h. In Group M, 8 patients and in Group K, 6 patients complained of sore throat at 2 h but not statistically significant ($P = 0.512$). At 4 h, 15 patients in Group M and 5 patients in Group K complained of sore throat and it was statistically significant ($P = 0.001$). At 6 h, 9 patients in Group M and 3 patients in Group K had sore throat, and it was statistically significant ($P = 0.047$). At 24 h, none of the patients in both the groups had sore throat. While comparing the severity of Sore throat, at 2 h Post extubation 7 patients in Group M and 5 patients in Group K had mild sore throat ($P=0.526$), while 1 patient in Group M and 1 patient in Group K had moderate sore throat ($P = 1.000$). At 4 h, 9 patients in Group M and 2 patients in Group K had mild sore throat ($P=0.022$), while 6 patients in Group M and 1 patient in Group B had moderate sore throat ($P = 0.046$). At 6 h, 8 patients in Group M and 2 patients in Group K had mild sore throat ($P=0.040$), while 1 patient in Group M and 1 patient in Group K had moderate sore throat ($P = 1.000$). At 24 h, no patients had sore throat.

CONCLUSION:

On the basis of our result, we can suggest that the use of perioperative ketamine nebulization when compared magnesium sulphate nebulization reduces the incidence and severity of post operative sore throat at 4th and 6th hour during postoperative period in patients who had received general anaesthesia with tracheal intubation.

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