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Assessment of nebulized ketamine for reductions of incidence and severity of post-operative sore throat

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Abstract

The main goal of the present study was to assess the effect of nebulized ketamine for decreasing the post-operative sore throat in the general anaesthetic patients.

Group A received a saline nebulisation 5.0 ml and Group Bs received ketamine 50 mg (1.0 ml) (with 4.0 ml of the saline) nebulisation. The primary outcome of the study was to measure the incidence of POST at 4 h post-operatively in adult patients undergoing surgery of duration of up to 1 h under GA.

The Post-operative sore throat is seen more controlled in the Ketamine nebulized patients. The time for the recovery if fast as compared to normal group patients. The age in the preent study was observed in the range of 20-60 years. In the Group A duration of surgery was observed for 40-50 mins where as in Group B 45-53 mins.

The use of pre-operative ketamine nebulisation reduced the incidence and severity of POST during early post-operative period in patients receiving GA with tracheal intubation.

Keywords: ketamine, nebulization, post-operative sore throat

Introduction

Postoperative sore throat (POST) and hoarseness after general anesthesia with tracheal intubation occurs in 30% to 70% of patients. Postoperative sore throat, while usually self-limiting, was rated by patients as one of the top 10 most undesirable postoperative outcomes. The etiology is probably one or more of the following: mechanical injury during intubation, damage to mucosa due to the pressure from the endotracheal (ET) tube cuff, and dehydration of the mucosa. The duration of time a patient stays in the post-anesthesia care unit, or potentially the facility, because of POST increases the cost of care. Patients with POST had a 14-minute longer stay in the post-anesthesia care unit and a 25-minute longer stay in the ambulatory care unit, and were discharged 51 minutes later from the facility compared with those who did not complain of POST. Reducing the severity and incidence of POST should decrease the length of stay and cost of care, and improve patient satisfaction.

Postoperative sore throat is a well-recognized complication that remains unresolved in patients undergoing tracheal intubation for general anesthesia (GA) with a reported incidence of 6.6-90%. It also increases the duration of hospital stay, especially in day care surgeries [1].

Numerous non-pharmacological and pharmacological measures have been used for attenuating POST with variable success. Among the non-pharmacological methods, smaller sized tracheal tubes, careful airway instrumentation, minimizing the number of laryngoscopy attempts, intubation after the full relaxation of the larynx, gentle oropharyngeal suctioning, filling the cuff with an anesthetic gas mixture, minimizing intracuff pressures <20 mm Hg, and extubation when the tracheal tube is fully deflated, have been reported to decrease the incidence of POST.

Pharmacological measures for attenuating POST are inhalation of beclomethasone and fluticasone, gargling with azulene sulfonate, aspirin, ketamine, benzydamine hydrochloride and licorice, local spray of benzydamine hydrochloride, and intracuff administration of alkalized lignocaine [2].

The main goal of the present study was to assess the effect of nebulized ketamine for decreasing the post-operative sore throat in the general anaesthetic patients.

Methodology

The study was planned in the Anugrah Narayan Magadh Medical College and Hospital undergoing the General Anaesthesia. The study was conducted from Dec 2015 to June 2017. The age group of the patients is ranges from 20 to 60 years. Total 50 patients in two groups each of 25 patients were evaluated for the study. As per the classification of the American Society of Anesthesiologists I and II physical conditions were enrolled on to the study. After taking informed written consent and approval of the Institutional Ethics Committee.

Following was the inclusion and Exclusion criteria of the study:

Inclusion Criteria

1. Age 20- 60 years
2. American Society of Anesthesiologists I and II physical conditions patients

Exclusion Criteria

1. Patients at particular risk of heart conditions, such as congenital disease
2. Pregnant/lactating females.
3. Patients who were predisposed to low levels of potassium and magnesium in the blood
4. Patients on other medications that lead to QT prolongation

Group A received a saline nebulisation 5.0 ml and Group Bs received ketamine 50 mg (1.0 ml) (with 4.0 ml of the saline) nebulisation.

The primary outcome of the study was to measure the incidence of POST at 4 h post-operatively in adult patients undergoing surgery of duration of up to 1 h under GA. The secondary outcomes included the incidence and severity of post-operative sore throat at immediate recovery, and post-operatively, evaluation of side-effects including nausea, vomiting, cough and dry mouth in both the groups.

Results & Discussion

The data from the 50 patients divided in two groups undergoing general anaesthesia were evaluated for the post-operative sore throat. The data is collected and presented as below.

Table 1: Demographic Data

	Group A	Group B
Age in years	32-48	26-52
Weight in Kg	51-70	55-78
Males	15	20
Females	10	5
Duration of Surgery	40-50 mins	45-53 mins

The age in the preent study was observed in the range of 20-60 years. In the Group A duration of surgery was observed for 40-50 mins where as in Group B 45-53 mins.

Table 2: Severity of post-operative sore throat in study group

Time for Recovery	Group A Patients	Group B Patients
Immediate	3	12
2 hr	3	6
4 hr	4	4
6 hr	4	3
8 hr	5	0
12 hr	3	0
24 hr	3	0

The Post-operative sore throat is seen more controlled in the Ketamine nebulized patients. The time for the recovery if fast as compared to normal group patients.

In an earlier study, pre-operative nebulisation with 3.0 ml (225 mg) of isotonic magnesium sulphate, also a NMDA receptor antagonist showed a decrease in incidence and severity of POST at 0, 2, 4 and 24 h post-operatively [3].

The primary outcome of the study was the incidence of POST at 4 h as by this time the patents are generally awake, alert, and more cooperative to participate in the study. This is also in line with earlier studies [4].

The authors measured serum ketamine levels intra-operatively and suggested that with such low levels of serum ketamine, the systemic absorption of ketamine was unlikely to have role in the attenuation of POST and rather suggested a topical effect of ketamine [4].

Ketamine gargle has been found to be effective in reducing the incidence and severity of POST due to its anti-inflammatory effects [5]. However, there are a few demerits of gargle ketamine over nebulization due to its bitter taste, large volume required for gargle with risk of aspiration if accidentally swallowed and patient cooperation.

Other pharmacological agents used earlier, include aspirin gargles, benzydamine hydrochloride (BH) gargles, transdermal ketoprofen, lignocaine 10% spray, IV dexamethasone, beclomethasone gel on tracheal tube and magnesium lozenges. All have been shown to reduce the incidence and severity of POST up to 24 h post-operatively [6]. Betamethasone gel applied over the endotracheal tube (ETT) and ketamine gargle were found to be comparable in attenuating POST during the first 24 post-operative hours after elective surgical procedures. However, the incidence of post-operative cough and hoarseness of voice was attenuated better with betamethasone application [7]. Lignocaine spray decreased incidence of cough at tracheal extubation in surgeries of <2 h [8]. Medicated lozenges of licorice had efficacy of decreasing POST in smokers for surgery under GA of more than 1 h [9]. Recently, siccoral and strefen have been found to be effective in relieving POST in the early hours following extubation [10].

Conclusion

The use of pre-operative ketamine nebulisation reduced the incidence and severity of POST during early post-operative period in patients receiving GA with tracheal intubation.

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