

Betamethasone Versus Ketamine for Attenuation of POST in Patients Undergoing Surgeries Under GA with Endotracheal Intubation- A Clinical Study

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Abstract

Background: Postoperative sore throat is one of the most common complications after endotracheal intubation. The present study was conducted to assess the role of betamethasone gel applied over the endotracheal tube cuff for attenuation of POST in patients undergoing surgeries under GA with endotracheal intubation and compare it with ketamine nebulization. **Subjects and Methods :** This is a randomized controlled prospective study conducted in 90 patients of either sex between 18-70 years of age divided into three groups. Group I patients received ketamine 50 mg, group II received 3 ml of water soluble 0.05% betamethasone gel, group III received 3 ml of water soluble 2% lignocaine. 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). **Results:** The mean duration of surgery in group I was 128.5 minutes, in group II was 131 minutes and in group III was 134.5 minutes. There were 6 (20%), 7 (23.3) and 14 (46.6%) cases in group I, II and III respectively. The difference was significant ($P < 0.05$). At 0 hour there were 3 cases in group I, II and 10 in group III, at 2 hours was 3, 5 and 12 in group I, II and III respectively, at 6 hours was 5, 4 and 14 cases in group I, II and III respectively, at 12 hours was 3, 3 and 12 cases in group I, II and III respectively and at 24 hours was 2, 2 and 12 cases in group I, II and III respectively. **Conclusion:** Authors found that POST can be equally managed with nebulisation with ketamine preoperatively and application of betamethasone gel over endotracheal tube cuff.

Keywords: Betamethasone, Ketamine, Nebulisation

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Introduction

Post-operative sore throat (POST) occurs in 21-65% of patients receiving general anaesthesia (GA) with tracheal intubation. Though considered as a minor complication, but it may cause significant post-operative morbidity and patient dissatisfaction.^[1] Various non-pharmacological and pharmacological trials have been used for attenuating POST with no proven single modality.^[2]

Postoperative sore throat is one of the most common complications after endotracheal intubation, which usually lingers for 12-24 hours after the operation. 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] The cuff design and pressure may affect tracheal mucosal capillary perfusion. Contact of tracheal tube with vocal cords and posterior pharyngeal wall result in edema and mucosal lesion. The common prophylactic measures used to decrease the incidence of POST include the use of smaller-sized endotracheal tubes with a low intracuff pressure.^[4]

The pharmacological methods used to reduce POST include use of beclomethasone gel, gargling with azulene sulphate, ketamine and licorice. Ketamine is an N-methyl-D-aspartate (NMDA) receptor antagonist and has been used as a gargle for reducing the incidence and severity of POST due to its anti-nociceptive and anti-inflammatory effects.^[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] The present study was conducted to assess the role of betamethasone gel applied over the endotracheal tube cuff for attenuation of POST in patients undergoing surgeries under GA with endotracheal intubation and compare it with ketamine nebulization.

Subjects and Methods

This is a randomized controlled prospective study conducted in 90 patients of either sex between 18-70 years of age divided into three groups. The study was undertaken at the hospital attached to PES institute of Medical sciences and Research, Andhra Pradesh.

General physical examination was done in all. Group I patients received ketamine 50 mg (1.0 ml) along with 4.0 ml of normal saline nebulization for 15 min via nebulization mask connected to wall mounted oxygen driven source at the rate of 8 lit /min, 25 min before surgery. Group II received 3 ml of water soluble 0.05% betamethasone gel applied over endotracheal tubes cuff. Group III received 3 ml of water soluble 2% lignocaine jelly applied over endotracheal tube cuff, taken as control.

Sore throat assessment and hemodynamic recording was done at pre-nebulization (baseline parameters before nebulization of patient), pre-induction (parameters after nebulization and just before induction of GA), immediately after extubation (0 h), 2, 6, 12 and 24 h post-operatively. 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). Results were statistically analyzed.

Results

Table 1: Distribution of groups

Groups	Group I	Group II	Group III
Agent	Ketamine	Betamethason gel	Lignocaine
Number	30	30	30

[Table 1] shows distribution of patients in different groups.

Table 2: Duration of surgery

Groups	Group I	Group II	Group III
Mean	128.5 ± 26.9	131 ± 24.29	134.5 ± 23.64

[Table 2] shows that mean duration of surgery in group I was 128.5 minutes, in group II was 131 minutes and in group III was 134.5 minutes.

Table 3: Incidence of POST in groups

Groups	Group I	Group II	Group III	P value
Number (%)	6 (20%)	7 (23.3)	14 (46.6%)	0.01

[Table 3] shows that there were 6 (20%), 7 (23.3) and 14 (46.6%) cases in group I, II and III respectively. The difference was significant (P< 0.05).

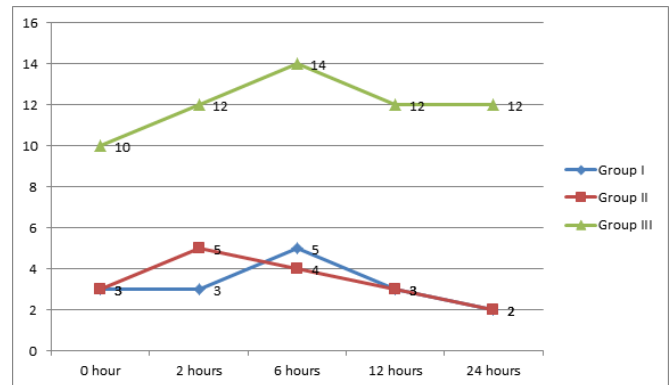


Figure 1: Incidence and severity of POST at different time intervals

[Figure 1] shows that at 0 hour there were 3 cases in group I, II and 10 in group III, at 2 hours was 3, 5 and 12 in group I, II and III respectively, at 6 hours was 5, 4 and 14 cases in group I, II and III respectively, at 12 hours was 3, 3 and 12 cases in group I, II and III respectively and at 24 hours was 2, 2 and 12 cases in group I, II and III respectively.

Discussion

Ketamine is N-methyl daspartate (NMDA) receptor antagonist and has been used as gargle or nebulization.^[7] Various pre-clinical and clinical studies have reported that clonidine produces antinociception regardless of the route of administration (central or peripheral).^[8] Topical administration of clonidine elicits antinociception by blocking the emerging pain signals at peripheral terminals through alpha 2 adrenoceptors without producing the undesirable central side effect observed after systemic administration.^[9] The present study was conducted to assess the role of betamethasone gel applied over the endotracheal tube cuff for attenuation of POST in patients undergoing surgeries under GA with endotracheal intubation and compare it with ketamine nebulization.

In present study, patients were divided into 3 groups. Group I patients received ketamine 50 mg (1.0 ml), group II received 0.05% betamethasone gel and group III received 2% lignocaine jelly applied over endotracheal tube cuff, taken as control.

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.^[10]

We found that mean duration of surgery in group I was 128.5 minutes, in group II was 131 minutes and in group III was 134.5 minutes. There were 6 (20%), 7 (23.3) and 14 (46.6%) cases in group I, II and III respectively. The difference was significant ($P < 0.05$).

Ketamine is N-Methyl daspartate (NMDA) receptor antagonist and has been used as gargle or nebulization. The mechanism of topical effect of ketamine nebulization was due to attenuation of the local inflammation and also due to peripheral analgesic effect of ketamine. The present study was conducted to assess the role of betamethasone gel applied over the endotracheal tube cuff for attenuation of POST in patients undergoing surgeries under GA with endotracheal intubation and compare it with ketamine nebulization.^[11]

Ahuja et al,^[11] included 100 patients belonging to American Society of Anaesthesiologists physical status I-II in the age group 20-60 years, of either sex undergoing surgery under general anaesthesia (GA) were enrolled. Patients 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 min. GA was induced 10 min after completion of nebulisation in the patients. 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. POST was graded on a four-point scale (0-3). The overall incidence of POST was 33%; 23 patients (46%) in saline and 10 patients (20%) in ketamine group experienced POST (Fisher's exact $P = 0.01$). The use of ketamine nebulization attenuated POST at 2 h and 4 h post-operatively ($P < 0.05$). The primary outcome was incidence of POST at 4 h; 13 patients in group S versus 4 patients in group K ($P = 0.03$) experienced POST at 4 h. The moderate sore throat occurred in 6 patients in group S and none in group K at 2 h, post-operatively ($P = 0.02$).

We found that at 0 hour there were 3 cases in group I, II and 10 in group III, at 2 hours was 3, 5 and 12 in group I, II and III respectively, at 6 hours was 5, 4 and 14 cases in group I, II and III respectively, at 12 hours was 3, 3 and 12 cases in group I, II and III respectively and at 24 hours was 2, 2 and 12 cases in group I, II and III respectively.

Lignocaine spray decreased incidence of cough at tracheal extubation in surgeries of < 2 h. Medicated lozenges of licorice had efficacy of decreasing POST in smokers for surgery under GA of more than 1 h. Recently, siccoral and strefen have been found to be effective in relieving POST in the early hours following extubation.^[12]

The shortcoming of the study is small sample size.

Conclusion

Authors found that POST can be equally managed with nebulisation with ketamine preoperatively and application of betamethasone gel over endotracheal tube cuff.

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