



To Compare the Efficacy of Betamethasone Gel and Lignocaine Gel Applied over Endotracheal Tube to Reduce Post Operative Sore Throat and Cough

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Background: Post-operative sore throat, cough and hoarseness of the voice are often common, uncomfortable sequelae after tracheal intubation with inflammation being the most common pathogenesis. Post operative sore throat and cough has a multifactorial aetiology that includes patient-related factors such as age, sex, and smoking, as well as intubation factors such as technique, duration, tube size, intracuff pressure, cuff design, trauma to the pharyngolaryngeal mucosa and various factors.

Objectives: To compare the incidence of post operative sore throat, cough after endotracheal tube intubation when applying betamethasone gel and lignocaine jelly.

Materials and Methods: At Saveetha Medical College and Hospital in Thandalam, Chennai, a prospective controlled double blinded study was done among patients who were scheduled for elective procedures under general anaesthesia with orotracheal intubation. The study comprised 60 patients who met the study's inclusion and exclusion criteria. The 60 patients were divided into two study groups each enrolled with 30 patients. Before the study could begin, approval from the institutional research board was required. Before the study began, an informed, written consent was obtained. The method used was Qualitative observational randomised double blind study by

using a computer-generated random number table and the sealed envelope approach, patients were assigned to one of two equal groups.

Following a pre-anaesthetic evaluation, 60 patients of either sex, aged 18 to 60 years, with an ASA physical status of I or II, who were undergoing elective surgery (likely to last up to 240 minutes) under general anaesthesia with orotracheal intubation and met the above inclusion criteria were included in the study. The differences between the study groups were analysed by chi square test and the "p" value used as a cut off for estimating statistical significance between groups is 0.05.

Results: The incidence and severity of post operative sore throat and cough after endotracheal intubation during 6 and 24 hours was found to be statistically significantly in patients in whom betamethasone was used. The results are significant at $p < 0.05$.

At 6 hours the incidence of post operative sore throat for betamethasone and lignocaine was 12% and 30% respectively. At 24 hours the incidence of post operative sore throat for betamethasone and lignocaine was 9.36% and 25.2% respectively.

At 6 hours the incidence of post operative cough for betamethasone and lignocaine was 8.4% and 24%. At 24 hours the incidence of post operative cough for betamethasone and lignocaine was 7.2% and 21.6% respectively.

Conclusion: The use of 0.05 percent betamethasone gel to lubricate the endotracheal tube before intubation helps to reduce the time it takes for symptoms to resolve.

Keywords: Endotracheal intubation; betamethasone; lignocaine; cough; post operative; general anaesthesia.

1. INTRODUCTION

Post-operative sore throat, cough and hoarseness of the voice are often common, uncomfortable sequelae after tracheal intubation with inflammation being the most common pathogenesis [1]. The prevalence of these complications were reported to be around 21% - 65% as per the literature available. With a reported prevalence ranging from 15% to 94% [2], postoperative sore throat has lately been classified as the second-most prevalent minor complaint in current clinical anesthesiology and during anaesthesia recovery. Sore throat is reported to occur 34 percent to 58 percent of the time with the implantation of the laryngeal mask airway. POST operative sore throat and cough has a multifactorial aetiology that includes patient-related factors such as age, sex, and smoking, as well as intubation factors such as technique, duration, tube size, intracuff pressure, cuff design, trauma to the pharyngolaryngeal mucosa, contact of the tracheal tube with vocal cords, pressure-induced tracheal mucosal capillary hypoperfusion, nitrous oxide use, and intraoperative tube movement and suctioning [3].

By decreasing bucking on the tracheal tube, local anaesthetic jelly, together with its lubricating characteristics, decreases the possible harm to the tracheal mucosa. Its significance in the prevention of Post operative sorethroat is unclear because it has any inherent anti-inflammatory properties. Steroids have been shown to have

anti-inflammatory properties. To investigate the reduction in Post operative sore throat and cough, we employed a water-soluble long-acting betamethasone steroid gel, an anti-inflammatory medication that is given topically [4]. This prospective, randomised, double-blind clinical study compared the effects of betamethasone gel and lignocaine jelly applied extensively over the endotracheal tube in reducing complications in patients under general anaesthesia with endotracheal intubation during the first 24 postoperative hours after elective surgical procedures.

2. MATERIALS AND METHODS

At Saveetha Medical College and Hospital in Thandalam, Chennai, a prospective controlled double blinded study was done among patients who were scheduled for elective procedures under general anaesthesia with orotracheal intubation. The study comprised 60 patients who met the study's inclusion and exclusion criteria. The 60 patients were divided into two study groups each enrolled with 30 patients. Before the study could begin, approval from the institutional research board was required. Before the study began, an informed, written consent was obtained. The following were the patients' inclusion and exclusion criteria:

2.1 Inclusion Criteria

- o Age group: 18- 60 years.
- o Physical status ASA class I-II

- o Undergoing elective surgeries
- o Duration of surgery <240 minutes.

2.2 Exclusion Criteria

- o Surgeries of oral cavity and pharynx or with anticipated difficult airway.
- o More than 2 attempts at intubation
- o Use of nasogastric tube or throat packs
- o Patients with upper respiratory tract infection
- o Patients on steroid therapy.

2.3 Method of Collection of Data

Following a pre-anaesthetic evaluation, 60 patients of either sex, aged 18 to 60 years, with an ASA physical status of I or II, who were undergoing elective surgery (likely to last up to 240 minutes) under general anaesthesia with orotracheal intubation and met the above inclusion criteria were included in the study.

The method used was Qualitative observational randomised double blind study by using a computer-generated random number table and the sealed envelope approach, patients were assigned to one of two equal groups:

- Betamethasone gel group: betamethasone gel 0.05%
- Lidocaine Jelly group: Lidocaine Jelly 2%

All patients were pre-medicated with inj.glycopyrolate 0.2 mg, inj.midazolam 1mg [4]. The PVC tracheal tube (Portex Profile tracheal tube) was lubricated from the distal end of the cuff to a distance of 15cm from the tip using 2.5ml of betamethasone gel, lidocaine jelly, spread uniformly with sterile precautions. Single use PVC tracheal tubes (Portex Profile tracheal tube), having low-pressure-high-volume cuffs, of appropriate size (Females 7.0-7.5 mm ID & Males 8.0-8.5 mm ID) were used [5]. After connecting to standard monitors, with I.V. access and preoxygenation, anaesthesia was induced with I.V.fentanyl 2 µg/kg and propofol 2 mg/kg. IV, succinylcholine 1.5 mg/kg IV was used for tracheal intubation.

All intubations were performed by an anaesthesiology resident, who was blinded to group allocation. Immediately after intubation, the tracheal tube cuff was inflated with just enough room air to prevent an audible leak. Anaesthesia was maintained with nitrous oxide, isoflurane in oxygen, and I.V. atracurium was repeated intermittently to maintain muscle relaxation. At

the end of the surgery, 100% oxygen was administered and residual neuromuscular block was antagonized with inj. Glycopyrolate 0.01mg/kg and inj. Neostigmine 0.05 mg/kg. Oral suctioning was done just before extubation only. The patient was extubated after deflating the cuff, and patient fully awake. Assessment of patients was done for post-operative sore throat and cough at 6, 24 hrs. after surgery with the help of questionnaire. To categorise data, comparison was done using Chi-square test (X²) [6].

Score:

Sore throat

0. No sore throat at any time since the extubation
1. Minimal sore throat
2. Moderate sore throat
3. Severe sore throat

Cough:

0. No cough at any time since the extubation
1. Minimal cough or scratchy throat
2. Moderate cough
3. Severe cough

The differences between the study groups were analysed by chi square test and the "p" value used as a cut off for estimating statistical significance between groups is 0.05.

2.4 Statistical Analysis

The information was then recorded into an excel file and sent to the Statistical Package for Social Services (SPSS vs 20). Frequencies and percentages were used to analyse the categorical data.

3. RESULTS

Sixty patients were randomized in to two groups for this study. No patient experienced failed intubation during the study. The incidence and severity of post operative sore throat and cough after endotracheal intubation during 6 and 24 hours was found to be statistically significantly in patients in whom betamethasone was used.

When groups were compared, there was a statistical significance in the incidence of sore throat for betamethasone and lignocaine at 6 hours was 12% and 30% respectively (P<0.004).

At 24 hours the incidence of sore throat for betamethasone and lignocaine was 9.36% and 25.2% respectively ($P < 0.0001$). This means that the incidence of post operative sore throat was less at 6 and 24 hours when betamethasone gel was applied on Endotracheal tube.

At 6 hours the incidence of cough for betamethasone and lignocaine was 8.4% and 24% respectively ($P < 0.0003$). At 24 hours the incidence of cough for betamethasone and lignocaine was 7.2% and 21.6% respectively ($P < 0.0001$). This means that patients who underwent intubation with betamethasone applied endotracheal tube experienced lesser incidence of cough in the post operative period.

Hence the use of betamethasone gel applied over endotracheal tube reduced the incidence of post operative sorethroat and cough.

This is a bar diagram (Fig. 1) representing the percentage of incidence of cough in post operative period (6, 24 hrs) in people who underwent endotracheal intubation with different

medications like betamethasone gel and lignocaine gel applied over it.

This is a bar diagram (Fig. 2) represents the percentage of incidence of cough in post operative period (6, 24 hrs) in people who underwent endotracheal intubation with different medications like betamethasone gel and lignocaine gel applied over it.

4. DISCUSSION

In our research, we discovered that when the endotracheal tube was lubricated with betamethasone gel instead of lignocaine gel, the incidence of sore throat and cough in the postoperative period was significantly lower.

The occurrence of postoperative sore throat varies according on the lubricants used, the degree of complex pressures applied, and the number of attempts made to implant the device. On the basis of the Harding and Mc vey questionnaire, the severity of postoperative sore throat and cough was documented at different time intervals such as 6 hours and 24 hours [7].

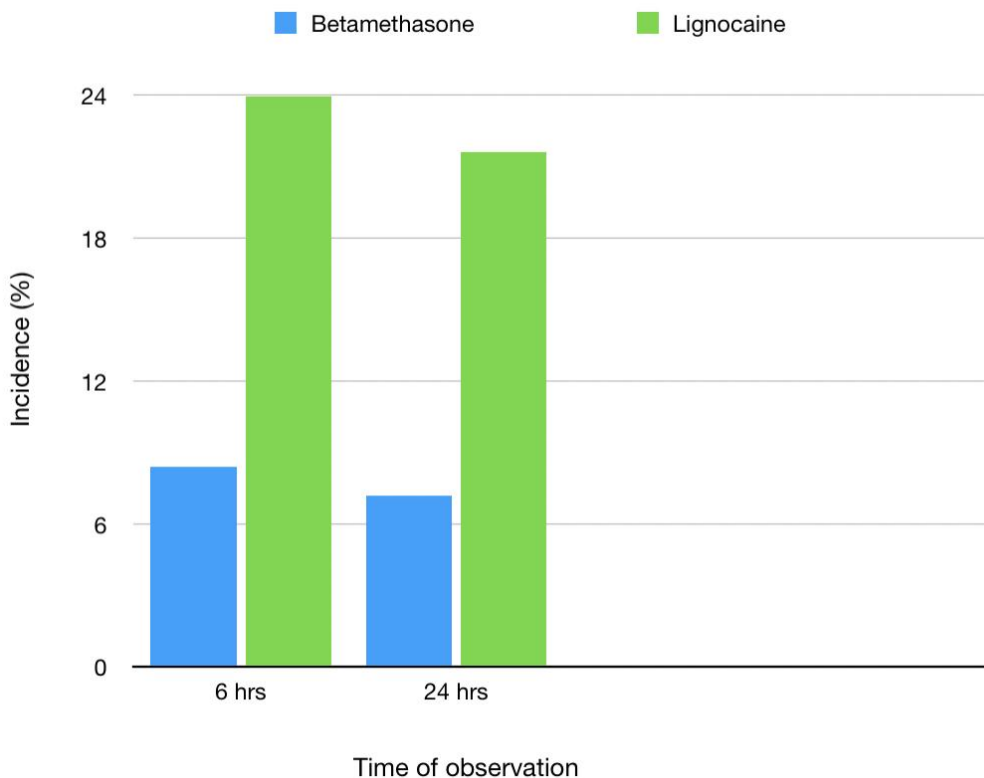


Fig. 1. Incidence of cough

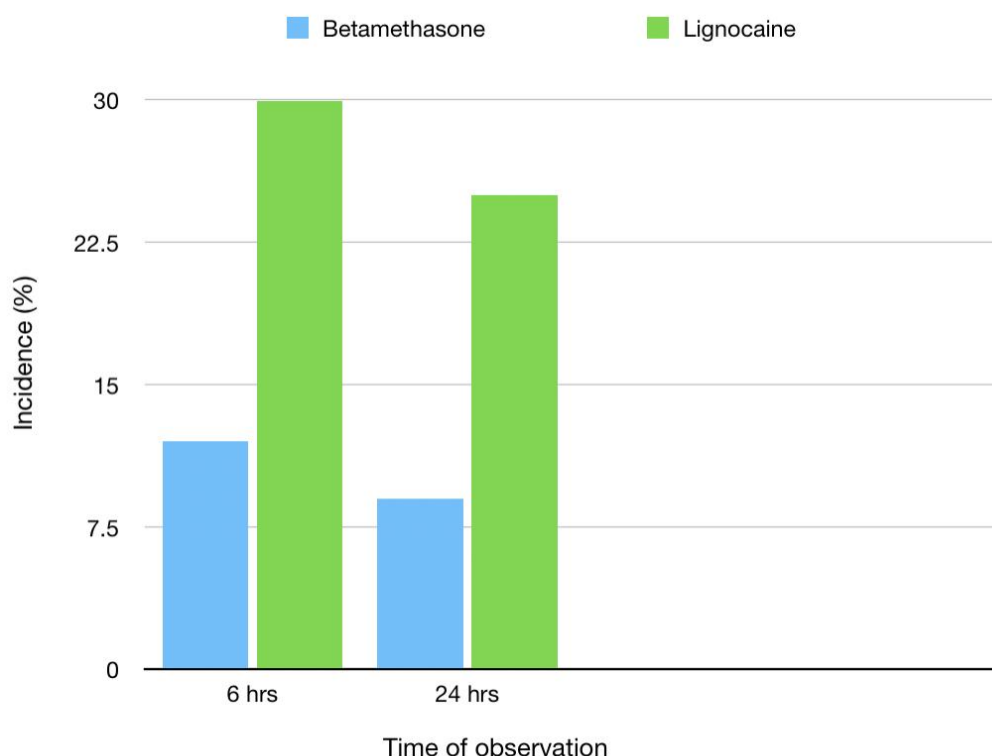


Fig. 2. Post OP sore throat

In a study in Egypt, Kiran et al (2012) compared the effect of 0.05% betamethasone gel with 2% lidocaine jelly. They reported that the post-operative sore throat is a minor complication after general anaesthesia. They conducted a study to compare the incidence of post-operative sore throat with 0.05% betamethasone gel and 2% lidocaine jelly as a lubricant for PLMA insertion in the patients undergoing general anaesthesia. Patients in group I had 2.5 ml of 0.05% of betamethasone gel while group II had 2.5 ml of 2% lidocaine jelly applied on the cuff of PLMA. After 24 hours 16% of the patients had the 1st degree sore throat and 3% had 2nd degree of sore throat in group II patients. In our study 60 patients were observed and we recorded the scores for 6 and 24 hours. The incidence of post operative sore throat was 9.36% after 24 hrs in patients where betamethasone was used(Here group1) and was 25.2% in patients where lignocaine was used (Here group 2).

In a prospective, randomized, double blind controlled study by Sumathi et al. [8], the incidence of post-operative sore throat, cough and hoarseness of voice after general tracheal anaesthesia when applying betamethasone gel

(Betamethasone gel group) or lidocaine jelly (Lidocaine Jelly group) on the tracheal tube. In the first 24 hours after surgery, the incidence of post-operative sore throat was 40, 100 and 100%; cough was 6, 40 and 28% for the Betamethasone gel, Lidocaine Jelly and control groups, respectively. Whereas in our study after 24 hrs the incidence of sore throat in our study was 9.36, 25.2% and cough was 7.2 and 21.6% for betamethasone and lignocaine jelly respectively. The incidence of post-operative sore throat, cough was significantly lower in the Betamethasone group when compared to other groups. It also supports the study done by George Allen [9].

Dhanpal et al. (2002) did a randomized double-blind study on 75 ASA I-II surgical patients to assess the effectiveness of the application of steroid gel as compared to lidocaine jelly or nothing applied to the endotracheal tube in decreasing the incidence of sore throat, hoarseness and cough after general endotracheal anaesthesia. The patients were questioned about these sequelae at 1,12 and 24 hours after general anaesthesia. The incidence of sore throat was 33.30 percent in the steroid gel group. In our study the incidence of sore

throat at 24 hrs was 9.36% with betamethasone which is lesser when compared to their study. It was 63.30 percent in the lidocaine gel group and in our study it was 25.2% with lignocaine which is also lesser.

The dose of betamethasone used in the study by Shashi Kiran et al. was 6.25 mg (2.5 ml of 0.05 percent). They concluded that using a betamethasone-lubricated endotracheal tube reduced the incidence of sore throat in the post-operative period [10,11,12], which is consistent with our findings.

Our findings back up those of ayoub and colleagues, as well as Selvaraj and Dhanapal. The administration of betamethasone gel reduces the incidence of postoperative sore throat and cough [13,14]. However, Ayoub only compared betamethasone to the control group, but we included lignocaine jelly in our trial.

5. CONCLUSION

The use of 0.05 percent betamethasone gel to lubricate the endotracheal tube before intubation helps to reduce the time it takes for symptoms to resolve. It will be beneficial throughout the incubation period for patients who are at high risk of acquiring post-operative airway issues. To improve the above-mentioned findings, more research with a larger sample size is required.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

We conducted our research after obtaining proper IEC approval.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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