

Comparison of Frequency of Sore Throat and Cough after Prophylactic Lignocaine and Beclomethasone in Adults

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ABSTRACT

Objective: To compare the frequency of sore throat and cough after prophylactic Lignocaine versus Beclomethasone in adults undergoing tracheal intubation.

Study Design: Prospective longitudinal study.

Place and Duration of Study: Anesthesia Department, Combined Military Hospital, Lahore Pakistan, from Jun to Sep 2019.

Methodology: A total of 180 patients of both gender scheduled for elective surgery under general anaesthesia with endotracheal intubation were recruited for this study. Ninety patients of Group-A received Lignocaine, while 90 patients of Group-B received Beclomethasone. After 24 hours of the procedure, sore throat and cough were assessed from both groups and noted.

Results: The age range in this study was from 18 to 50 years, with a mean age of 34.22 ± 5.31 years in Group -A while 36.57 ± 7.22 years in Group-B. Sore throat was seen in 22(24.4%) patients in Lignocaine-Group (Group-A) as compared to 9(10.0%) patients in Beclomethasone-Group (Group-B) ($p=0.010$). Cough was seen in 18(20.0%) patients in the Lignocaine-Group as compared to 5(5.6%) patients in the Beclomethasone-Group ($p=0.003$).

Conclusion: This study concluded that spraying Beclomethasone on the endotracheal tube reduces the frequency and severity of postoperative sore throat and cough in patients given general anaesthesia with endotracheal intubation.

Keywords: Beclomethasone, Cough, Lignocaine, Sore throat, Tracheal intubation.

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INTRODUCTION

Tracheal intubation is associated with a risk of postoperative sore throat and cough.¹ These complications are quite common and prove to be very distressing for patients. The incidence of sore throat,² after general anaesthesia has been reported to be up to 62%. Several risk factors have been identified for this complication, including female gender, smoking, intubation difficulty, use of Suxamethonium, high pressure in endotracheal tube (ETT) cuffs, repeated airway suctioning, prolonged surgery and large ETT size.³ In addition, age has an inverse relation with the frequency of postoperative sore throats.

Various strategies have been employed to reduce the incidence and severity of sore throat caused by endotracheal intubation with variable results. Several researchers have used 2% topical Lignocaine application on ETT tubes with varying degrees of success.^{4,5} The study by Amucheazi *et al.*⁶ concluded that 2% intracuff Lignocaine effectively decreases the incidence of cough and sore throat after tracheal intubation for

general anaesthesia. Lignocaine is a sodium channel blocker, the most commonly used local anaesthetic drug. Once given in proximity to neural tissue, it transiently can produce loss of motor, sensory, and autonomic functions. It also has antiarrhythmic properties and belongs to the Class-Ib Group of antiarrhythmic drugs. Lidocaine infusion has been used for supplementation of general anaesthesia. Lignocaine infusion has reported a 40% reduction in the minimum alveolar concentration of volatile anaesthetics. Lignocaine infusion is also used for postoperative and chronic pain relief.⁷

The incidence of postoperative sore throat and cough is reduced by prophylactic use of systemic and topical corticosteroids, perhaps by altering the inflammatory response induced by tissue injury.^{8,9} Beclomethasone Dipropionate belongs to the second generation synthetic corticosteroid group. It has structural similarities with dexamethasone. It is converted to its active metabolite Beclomethasone 17-Monopropionate. Its therapeutic actions are mediated through glucocorticoid receptors. The affinity of Beclomethasone Dipropionate to bind with the glucocorticoid receptor is very weak, and it is rapidly converted into 17-Monopropionate on administration. Beclomethasone

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dipropionate is available in oral inhalation, intranasal, and topical formulations.¹⁰

The rationale of this study was to compare the effectiveness of the two drugs for the prevention of sore throat, a common bothersome common side effect of tracheal intubation. Results of this study will help to select better prophylactic treatment for the prevention of sore throat and cough in adults undergoing tracheal intubation in our general population.

METHODOLOGY

This prospective longitudinal study was conducted at the Anaesthesia Department, Combined Military Hospital, Lahore Pakistan, from June to September 2019, after approval from the Hospital Review Ethical Committee (Ref no. 1306/2019/Trg/Adm).

Sample size was calculated with 95% confidence level and $\alpha=5\%$ (two-sided) with power=80%. While $p_1=20\%$ and $p_2=6\%$, where p_1 was the expected least proportion (cough) in Population-1 and p_2 was the expected proportion (cough) in Population-2 in the reference study.⁹ Estimated sample size was 180. Patients were selected using a nonprobability consecutive sampling technique.

Inclusion Criteria: Patients between 18-50 years, of either gender with American society of anesthesiology (ASA) score I & II who were scheduled for elective surgery under endotracheal anaesthesia were included in the study.

Exclusion Criteria: Patients with a history of upper respiratory tract infection, sore throat and cough, patients with naso/orogastric tube in place, patients scheduled for throat surgery and patients on steroid therapy were excluded from the study.

Written consent for participation in the study was taken from all the patients. Demographic data, including age, gender, ASA grade and weight of patients, was taken and noted on specially designed proforma. The blind balloting method randomly divided 180 patients into two Groups. Ninety patients were placed in Group-A (Lignocaine-Group), while 90 were placed in Group-B (Beclomethasone-Group).

Patients were labelled to have a postoperative sore throat if they complained of throat pain (Visual analogue scale score >3),¹⁰ or throat irritation that worsened with swallowing (Figure). Cough was labelled when the patient had more than three episodes of cough within 24 hours postoperatively.

After standard monitoring and premedication of 0.01mg/kg Nalbuphine, 0.05mg/kg Dexamethasone

and 0.1mg/kg Dimenhydrinate, general anaesthesia was induced with 1-3mg/kg intravenous Propofol and 0.5mg/kg Atracurium. All patients were intubated using low-pressure and high-volume cuffs. Macintosh laryngoscope with a standard blade size of 3 was used for laryngoscopy. Anaesthesia residents with at least three years of experience in anaesthesia performed the laryngoscopy and intubation. In addition, 10% Lignocaine was sprayed on ETT in Group-A and 50% Beclomethasone in Group-B before endotracheal intubation. Medications were sprayed by an anaesthesia assistant who was blinded to the treatment. Room air was used to inflate the ETT cuffs. Cuff pressure was kept between 20 to 25 centimetres of water. A Cuff pressure gauge was used to measure the pressure. Cuff pressure was measured twice during surgery, once after intubation and the second just at the end of the surgical procedure.

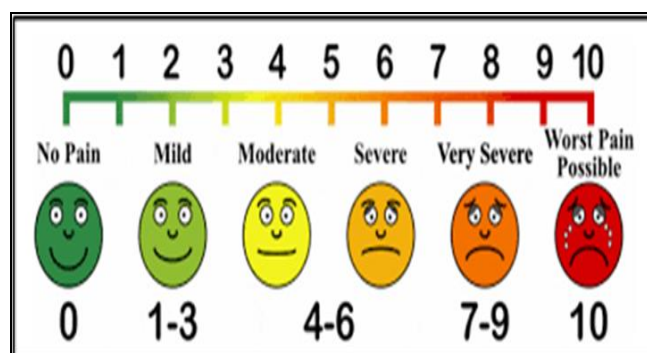


Figure: Visual Analogue Scale

After 24 hours of the procedure, sore throat and cough were assessed and noted in the proforma. Statistical Package for Social Sciences (SPSS) version 23:00 was used for the data analysis. Mean \pm SD was calculated for weight and age. In addition, frequencies and percentages were computed gender, ASA grade, sore throat and cough. The Chi-square test was applied to compare the sore throat and cough of both Groups. The p -value lower than or up to 0.05 was considered as significant.

RESULTS

Both Groups were comparable in demographic characteristics. The age range in our study was from 18 to 50 years, with a mean age of 34.22 \pm 5.31 years in Group-A, while in Group-B, it was 36.57 \pm 7.22 years. The mean weight was calculated to be 77.05 \pm 10.34Kg for Group-A while it was 76.56 \pm 10.80Kg for Group-B. Male gender was dominant in both Groups, i.e. 62.2% and 67.8%, respectively. In Group-A, 56 patients were

Sore Throat and Cough after Prophylactic Lignocaine

males, while 34 were females. In Group-B, 61 were males, while 29 were females. The frequency and Percentage of ASA Grades in Group-A and B were shown in Table-I.

Table-I: American Society of Anesthesiology (ASA) Grades in Study Groups (n=180)

American Society of Anesthesiology (ASA) Grades	Group-A n=90	Group-B n=90
I	69 (76.7%)	74 (82.2%)
II	21 (23.3%)	16 (17.8%)
Total	90 (100%)	90 (100%)

In Group-A, sore throat was seen in 22(24.4%) patients. While in Group-B it was seen in 9(10%) (Table-II). In Group-A, the cough was seen in 18(20%) patients. While in Group-B it was seen in 5(5.6%) (Table-III).

Table-II: Comparison of Sore throat in Study Groups (n=180)

Sore throat	Group-A n=90	Group-B n=90	p-value
Yes	22 (24.4%)	9 (10.0%)	0.010
No	68 (75.6%)	81(90.0%)	

Table-III: Comparison of Cough in Study Groups (n=180)

Cough	Group-A n=90	Group-B n=90	p-value
Yes	18 (20.0%)	5 (5.6%)	0.003
No	72 (80.0%)	85(94.4%)	

DISCUSSION

In our study, it was observed that Beclomethasone significantly decreased the incidence and severity of postoperative sore throat and cough compared to Lignocaine.

Beclomethasone has previously been used effectively to reduce the incidence of postoperative cough and sore throat.¹¹ One study showed that the incidence of hoarseness of voice, cough and sore throat was significantly less with topical application of Beclomethasone gel over the endotracheal tube compared to the application of Lignocaine gel.^{12,13} In another study, reduced incidence and severity of sore throat in cases of tracheal intubation were seen when intravenous dexamethasone was given prophylactically.¹⁴ The hoarseness of voice, sore throat and cough following laryngoscopy and endotracheal intubation result from local tissue trauma, inflammation and oedema in parts of the throat and upper airways. Topical or intravenous corticosteroids diminish tissue irritation, oedema and inflammatory response to oedema in airways. This, in turn, results in decreased incidence and severity of cough and sore throat.¹⁵ Another study by

Stride showed that topical application of cream hydrocortisone 1% could not successfully reduce the incidence of post-op sore throat.¹⁶

Our study showed that Lidocaine was not as effective as Beclomethasone in decreasing the incidence of cough and sore throat. Another study by Mekhemar *et al.*¹⁷ showed that Lignocaine application either has very little or no effect on a postoperative sore throat. The exact mechanism of action of Lignocaine for suppression of sore throat and cough by Lignocaine is not well understood. It has been reported in many studies in past that local anaesthetics act by minimizing the local inflammatory response and tissue damage. It is thought that local anaesthetics enforce their anti-inflammatory effect by inhibiting the ion exchange by the membrane channels.¹⁸

No adverse effects of topical Beclomethasone were observed or reported in our study. Therefore, more research is required to determine a safe topical prophylactic dosage of Beclomethasone.

CONCLUSION

This study concluded that spraying Beclomethasone on the endotracheal tube decreases the incidence and severity of post-extubation sore throat and cough in patients who were given general endotracheal anaesthesia.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

- AA & NA: Data analysis, data interpretation, critical review, approval of the final version to be published.
- HS: Conception, study design, drafting the manuscript, approval of the final version to be published.
- AH & MS: Data acquisition, Critical review, approval of the final version to be published.
- MA: Critical review, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Sore Throat and Cough after Prophylactic Lignocaine

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