

## ORIGINAL ARTICLE

# Comparing the Effectiveness of Betamethasone Gel with Lidocaine Gel Application on Endotracheal Tube in Preventing Post Operating Sore Throat

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## ABSTRACT

**Objective:** To compare the effectiveness of betamethasone gel and lidocaine gel application in reduction of post-operative sore throat.

Study Design: Randomized controlled trial

Place and Duration: Study was conducted at anesthesia department of Dow University of Health Sciences, Karachi with duration from May 2022 to October 2022.

**Methodology:** A total of 54 patients were enrolled and divided into two groups Betamethasone and Lidocaine (Lignocaine) by lottery method. In one group betamethasone gel 0.05% was applied over endotracheal tube (ETT) and in other group lignocaine gel 4% was applied over the ETT. SPSS version 23 was used for data analysis. Mean  $\pm$  SD and frequency (percentage) were calculated for numerical and categorical data respectively.

**Results:** Majority of the patients in betamethasone group, 15 (55.6%) patients, had not developed sore throat whereas mild and moderate sore throat was most common in lidocaine group. Further, 5 (18.5%) patients in lidocaine group and only 2 (7.4%) patients in betamethasone group was severe sore throat. ( $p=0.015$ ).

**Practical implication:** Sore throat is a common post-operative complication having potential to lead poor surgical results. This study will help the clinicians/anesthesiologists to overcome the problem and reduce the incidence of sore throat in routine practice.

**Conclusion:** Application of betamethasone gel over endotracheal tube just before insertion is associated with reduced risk of sore throat as compare to lignocaine gel.

**Keywords:** Lidocaine gel, Betamethasone gel, Post-operative sore throat, Laryngoscopy, Endotracheal tube.

## INTRODUCTION

Post-operative sore throat and other symptoms of respiratory tract like hoarseness of voice and cough are recognized complications of general anesthesia caused by endotracheal intubation<sup>1, 2</sup>. Insertion of endotracheal tube and extubation process increase the distress and post-operative morbidity. Incidence of post-operative airway symptoms reported in different studies varies from lowest 20% to highest 100%<sup>3,4</sup>.

Sore throat and cough are common complications after surgical procedure under general anesthesia that can indicate some potentially dangerous situations like cardiac dysrhythmia, hypertension, surgical bleeding myocardial ischemia, increased intra cranial or intraocular pressure and bronchospasm<sup>5</sup>. Factors of sore throat development include pharyngeal or laryngeal trauma, air way inflammation, vocal cord trigger with ETT, design of tube cuff, pressure over pharyngeal wall, capillary hypo-perfusion, mucosal lesions and edema of pharyngeal wall<sup>6</sup>.

Numerous drugs are in practice to overcome complications of endotracheal tube. Administration of dexamethasone intravenously has capability to decrease inflammatory response along with provision of anti-emetic and analgesic effect<sup>7</sup>. Steroid administration provides protection from severity and incidence rate after removal of tube<sup>8,9</sup>. Some technical measures like use of low pressure cuff, small size cuff, intravenous and external application of lignocaine, ketamine gargle, topical spray of steroids and application of steroids over endotracheal tube are also useful<sup>11</sup>.

Very few studies were conducted on this topic before to justify the role of both medicines in reduction of post-operative sore throat. Our study will be a good addition in literature available in field of anesthesia and cover the complications occurred because of endotracheal intubation in post-operative period.

## METHODOLOGY

This randomized control trial was conducted at anesthesia department of Dow University of Health Sciences, Karachi with duration from May 2022 to October 2022. Study was started after permission of ethical review board and dually signed consent form

was taken from patients after detail information about study purpose and confidentiality of work. Ethical approval from department of academic affairs of the hospital was obtained. Age of patients below 30 and above 60 years selected for elective surgical procedure under GA were enrolled and patients using anti-inflammatory drugs, pain killers or analgesics before surgery and any patients having history allergy to study drugs, GERD and asthmatic were excluded.

Non probability consecutive sampling technique was used and sample size was calculated by using online sample size calculator and following statistics: Confidence interval 95%, power of study 80%, proportion of sore throat in betamethasone group 88.3%, Proportion of sore throat in lignocaine group 66.1%, calculated sample size was 54 patients and 27 patients in each group

Patients were divided into two groups (group B and L) by using lottery method. In group B 0.05% betamethasone gel was applied over the tracheal tube before insertion and in group L lidocaine gel 4.0% was applied over the tracheal tube. Severity of sore throat was determined by using a specific grading system: "0" score represents the absence of sore throat, "1" Sore throat seen less than common cold, "2" score moderate sore throat seen under common cold, "3" severe sore throat seen more than common cold<sup>9</sup>

After insertion of two large bore intravenous cannulas on dorsal side of hands and arterial line induction of anesthesia was done with standard hospital protocols using nalbuphine, midazolam and atracurium. Maintenance of anesthesia was done by using intravenous anesthetics (propofol and fentanyl) and inhalational anesthetics (Isoflurane). Pulse oximetry and blood pressure monitoring was done by invasive way and endotracheal intubation was attained in first attempt by a senior anesthetist having minimum five years' experience of endotracheal intubation. Assessment of sore throat development was also done by a senior anesthetist who is blind to study groups.

SPSS version 23 was used for data analysis mean and standard deviation was calculated for numerical data and

frequency and percentages was calculated for categorical data. Test of significance was applied and probability value  $\leq 0.05$  was taken as significant.

**RESULTS**

Overall, 54 patients were included in our study. Betamethasone gel applied to 27 (50.0%) patients and lidocaine gel applied to 27 (50.0%) patients. The average age, gender distribution, BMI were almost the same in both the groups, ( $p>0.050$ ). The average intubation time in betamethasone and lidocaine gel patients was  $5.15\pm 2.12$  hours and  $5.55\pm 1.84$  hours, respectively, ( $p=0.455$ ). Whereas, the average duration of surgery of betamethasone and lidocaine gel patients was  $124.18\pm 9.58$  minutes and  $123.92\pm 9.85$  minutes, respectively, ( $p=0.922$ ). (Table. I).

The incidence and severity of sore throat in both the groups were shown in table. II. Majority of the patients in betamethasone group, 15 (55.6%) patients, had not developed sore throat whereas mild and moderate sore throat was most common in lidocaine group. Further, 5 (18.5%) patients in lidocaine group and only 2 (7.4%) patients in betamethasone group was severe sore throat. ( $p=0.015$ ). (Table. II).

Table-1: Comparison of demographic and operative characteristics of both the groups

Characteristic	Group		p-value
	Betamethasone	Lidocaine	
Age (years)	35.85±6.35	38.07±5.06	0.161
Gender			
Male	13 (48.1)	16 (59.3)	0.413
Female	14 (51.9)	11 (40.7)	
BMI (kg/m <sup>2</sup> )	23.24±2.63	23.84±2.71	0.418
Intubation time (hours)	5.15±2.12	5.55±1.84	0.455
Duration of surgery (min)	124.18±9.58	123.92±9.85	0.922

Table-2: Incidence and severity of sore throat in both the groups

Sore throat	Group		p-value
	Betamethasone	Lidocaine	
0	15 (55.6)	4 (14.8)	0.015
1	7 (25.9)	10 (37.0)	
2	3 (11.1)	8 (29.6)	
3	2 (7.4)	5 (18.5)	

**DISCUSSION**

A common complication of general anesthesia and endotracheal intubation is post-operative sore throat. Tracheal intubation is associated with irritation, inflammation of laryngeal mucosa trauma to throat that can cause post-operative sore throat (POST)<sup>11</sup>. In a study conducted by Fayyaz A et al<sup>12</sup> included 120 patients who were planned for surgical procedure under general anesthesia and reported incidence of sore throat 88.3% in betamethasone gel group and 66.1% in lignocaine gel group.

Role of steroids either intravenous or local application was evaluated in number of previous studies. In a study conducted by Tabari et al<sup>13</sup> local betamethasone gel, intravenous dexamethasone and control group were compared and it was reported that local application of steroid gel on endotracheal tube can reduce POST significantly. In steroid gel group 10.7% patients develop POST and in control and IV dexamethasone group 30.7% and 26.7% patients develop POST respectively. Similarly Sarki et al<sup>14</sup> conducted a study on comparison of betamethasone gel and lignocaine jelly and reported that betamethasone gel is more effective in reduction the risk of POST as compare to lignocaine jelly.

Selvaraj et al<sup>15</sup> conducted a study on comparison of betamethasone gel, lignocaine gel and in third group nothing was applied on endotracheal tube. At the end of sore throat symptoms and complaints was received in 33.3% of patients in betamethasone gel and 73.3% in other two groups, results were statistically significant ( $p<0.01$ ). Another study was conducted by Handady et al<sup>16</sup> on population of Sordan and reported efficacy of

steroid gel (Betamethasone) in reduction of post-operative cough and sore throat.

In a recent study conducted by Imayaval et al<sup>17</sup> on comparison of lignocaine gel and betamethasone gel applied endotracheal tube to reduce the incidence of cough and sore throat. Study concluded that 0.05% betamethasone gel is more effective in reduction of sore throat and cough. Similar findings were reported by Thapa et al<sup>18</sup> that 0.05% betamethasone gel and is more effective and reduce the incidence of sore throat to a significant level as compare to 2% lignocaine jelly when applied over endotracheal tube just before insertion.

Kazemi et al<sup>19</sup> described that prolonged anti-inflammatory effect of steroid or betamethasone gel can reduce the incidence of sore throat and hoarseness in patients who were operated under general anesthesia. Kajal et al<sup>20</sup> also conducted a similar study and reported that betamethasone gel is more effective in reduction of post-operative sore throat when compared with intubation with intravenous dexamethasone.

**CONCLUSION**

Application of betamethasone gel over endotracheal tube just before insertion is associated with reduced risk of sore throat as compare to lignocaine gel.

**Limitations:** Small sample size and single center sampling are main limitations of our study.

**Recommendations:** Multi center studies and large meta-analysis are recommended to evaluate exact incidence and prevention of this complication after GA.

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**Conflict of Interest:** None

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