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Betamethasone Gel Compared with Lidocaine Gel to Reduce Tracheal Tube Related Post-operative Airway Symptoms

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مقارنة بيتاميثازون جل مع ليدوكائين جل في تقليل أعراض مجرى الهواء في القصبة الهوائية بعد الجراحة

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Abstract

Background: The commonest method to secure airway in general anesthesia is the use of cuffed Endotracheal Tube (ETT), However the recovery are often complicated by ETT induced airway and circulatory reflexes which can lead to potentially dangerous complications. A lot of studies and researches have been focused on prevention of these emergence phenomena (EP); nevertheless, the problem is still far from final solution. Aim: To compare the efficacy of Lidocaine gel vs. Betamethasone gel in attenuating the ETT induced EP. Patients and methods: 51 patients who were been chosen for elective intermediate average duration operations and were in class 1 & 2 of American society of anesthesiologist (ASA). Patients were randomly assigned to receive Betamethasone gel or Lidocaine gel or normal saline (NS.) as a lubricant to the endotracheal tube. Coughing &/or bucking at emergence of anesthesia was evaluated as either present or not by blinded observer. The patients were also observed for development of hoarseness of voice and laryngeal spasm along with the vital signs during recovery phase and observed for sore throat, hoarseness of voice after 1 hr., 6 hrs. and 12 hrs. post-operative .Results: the incidence of sore throat, hoarseness of voice and cough was lowest in group B (Betamethasone) rather than group A (Lidocaine) and control group C (Normal saline). Conclusions: Applying Betamethasone and lidocaine gel on the endotracheal tube is a simple and effective method of reducing the incidence of post-operative laryngeal spasm, sore throat, cough and hoarseness of voice in patients under general anesthesia with endotracheal intubation.

Keywords: Endotracheal tube, Lidocaine, Betamethasone, Extubation.

المستخلص

إن الطريقة الأكثر شيوعًا لتأمين مجرى الهواء في التخدير العام هي استخدام أنبوب القصبة الهوائية المقيّد (ETT) ، ومع ذلك فإن التعافي غالبًا ما يكون معقدًا بسبب مجرى الهواء الناجم عن الانعكاسات الدورانية التي يسببها ETT والتي يمكن أن تؤدي إلى مضاعفات خطيرة محتملة. لقد ركزت الكثير من الدراسات والأبحاث على الوقاية من هذه الظواهر الناشئة (EP) ؛ ومع ذلك ، لا تزال المشكلة بعيدة عن الحل النهائي. هدفت الدراسة الحالية الى مقارنة فعالية ليدوكائين جل مقابل بيتاميثازون جل في تخفيف EPT المحرض. اختير 51 مريضًا لإجراء عمليات اختيارية متوسطة المدة وكانوا في الفئة 1 و 2 من المجتمع الأمريكي لأطباء التخدير (ASA)). هؤلاء المرضى اختيروا عشوائياً لتلقي بيتاميثازون جل أو ليدوكائين جل أو محلول ملحي عادي (NS.) كمواد تشحيم للأنبوب الرغامي. قيم السعال و / أو الجماح عند ظهور التخدير على أنه إما موجود أو غير موجود بواسطة مراقب أعمى. كما لوحظ أن المرضى يعانون من بحة في الصوت وتشنج الحنجرة إلى جانب العلامات الحيوية أثناء مرحلة الشفاء ، كما لوحظ وجود التهاب في الحلق ، وبحة في الصوت بعد ساعة واحدة ، 6 ساعات و 12 ساعة. بينت النتائج حدوث التهاب الحلق وبحة الصوت والسعال أقل في المجموعة ب (بيتاميثازون) مقارنة مع المجموعة أ (ليدوكائين) والمجموعة الضابطة (محلول ملحي عادي). استنتج من هذه الدراسة ان تطبيق بيتاميثازون جل و يدوكائين جل على الأنبوب الرغامي هو طريقة بسيطة وفعالة للحد من حدوث تشنج الحنجرة بعد الجراحة والتهاب الحلق والسعال وبحة الصوت في المرضى تحت التخدير العام مع التنبيب الرغامي.

الكلمات المفتاحية: الأنبوب الرغامي ، ليدوكائين ، بيتاميثازون ، نزع الأنبوب.

Introduction

Emergence from general anesthesia implies liberation of the patient from the state of anesthesia. The indication for anesthetic state no longer exists at the end of surgery; the patient should ideally be free from effects of anesthetics and only analgesia needs to be continued. The emergence should happen in a short-time, smooth and free from undesirable effects, a consequence of residual effects of anesthesia and altered physiology related to airway, respiration, autonomic, metabolic and endocrine functions. Along with the advent of newer anesthetic agents, reversal agents/antidotes and monitoring devices, there have been improved understanding of arousal pathways in the nervous system contributing to faster and smoother emergence from anesthesia (Bhaskar, 2013). Many problems may occur as a result of intubation and extubation that include cardiovascular response, coughing and laryngospasm, regurgitation and aspiration of gastric contents, airway obstruction and Laryngeal trauma (Yentis, 2013) (Karmarkar & Varshney, 2008).

Lidocaine hydrochloride (Lignocaine) which is an amide local anaesthetic agent, introduced in 1947 used mainly as local anesthesia. Often combined with adrenaline, since lidocaine tends to produce local vasodilatation and administration intravenously to depress laryngeal and tracheal reflexes (e.g. during tracheal intubation/extubation) (Mitchell *et al.,* 2012) (DDJ & DB, 2005) . Moreover, it is commonly used to reduce the increase in intracranial pressure (ICP) caused by laryngoscopy. Possibly reduces muscle pains and potassium increase after suxamethonium. It has been also used to produce analgesia and general anesthesia (although its

therapeutic ratio is low). 4–10% lidocaine has been used instead of air to inflate the tracheal tube cuff, thereby reducing postoperative sore throat and hoarseness. furthermore, it is also considered as class I antiarrhythmic drug in ventricular Tachyarrhythmia. Lidocaine is thought to be more toxic to nerve tissue when directly applied than other local anesthetic, hence the increased incidence of transient radicular irritation syndrome following its use for spinal anesthesia than with other drugs (hyperbaricity of the solution and use of very thin needles/catheters are also thought to contribute by encouraging pooling of drug around spinal nerves). This has led to revision of the drug's data sheet to specify dilution to 2.5% before administration (even this concentration has been implicated in causing transient symptoms) (Haas *et al.,* 2014 ; Yentis, 2017).

Topical corticosteroids are widely used for inflammatory and hyper proliferative disorders in dermatology. Numerous topical corticosteroids with high local activity have been developed over the years, with a focus to develop drugs with high efficacy locally and minimum risk for adverse drug reactions. They are available in a number of formulations. Their therapeutic effects are a result of their anti-inflammatory, immunosuppressant, vaso constrictive and anti-proliferative actions. An appropriate topical corticosteroid is selected on the basis of the dermatological condition to be treated, patient-related factors and the physicochemical properties of the drug. Their use is associated with mainly local adverse drug reactions, but prolonged use and/or use of high potency topical corticosteroids may cause systemic effects (Kazemi & Amini, 2007 ; Lahir, 2018).

This study was aimed to compare the efficacy of Lidocaine gel versus Betamethasone gel in attenuating the ETT induced EP.

Methods

This study is prospective, randomized, double-blinded clinical trial. The study was conducted in the elective operation theatres in Madenat Al-Imamaein Al-Kadhumain Medical Centre in Baghdad, Iraq, from November 2017 till January 2018. In this study 51 patient were candidate to elective surgery, patient were divided into three equal groups. Group A received Lidocaine gel as a lubricant to ETT, group B received Betamethasone gel as a lubricant and group C lubricated with normal saline (NS.) in testing for attenuating the ETT induced EP. The types of surgery. Approval were obtained from Iraqi Committee for medical specializations as well as written informed written consent for participation in the study was signed by investigated subjects according to the Helsinki principles.

The inclusion criteria:

1. Elective operation in which patient will need ETT.
2. ASA class one and two.
3. Length of operation between 30 min and two hours.

The exclusion criteria:

1. Cases with allergy to medications used in the study.
2. Patient with cough or had asthma or chronic obstructive airway disease.
3. Recent respiratory infection.
4. Patient at risk of aspiration like pregnant lady, morbid obesity, Active gastro esophageal reflux and hiatal hernia.

5. Laryngeal or tracheal surgery or pathology.
6. If nasogastric tube were anticipated after surgery.
7. Anticipated difficult intubation.
8. Patient with history of smoking.
9. Pharyngeal, oral and nose surgeries.
10. Patient refusal.

Study procedure:

Before induction of anesthesia name, age, gender, patient identification number, weight, American society of anesthesiologist (ASA) class, name of operation and initial vital signs all were recorded. Anesthesia was induced with medications mentioned above, and then endotracheal intubation with a high volume low pressure cuffed ETT was performed by direct laryngoscopy. At the end of surgery, neuromuscular blockade was reversed with neostigmine and atropine. After skin closure, Sevoflurane was turned off. Oral suctioning was done before extubation. During the emergence phase 100 percent oxygen was administered .The patients were extubated when they met the standardized extubation criteria.

Once Sevoflurane was discontinued, a blinded observer starts to record. The mean arterial blood pressure (MAP), heart rate (HR), all been recorded after extubation as well as the duration of the operation. Presence of spasm, bucking, cough and hoarseness of voice also recorded. Also patient evaluated for the presence of sore throat, hoarseness of voice, coughs in the post anesthesia recovery unit, 1hr, 6hr and 12 hr. post-operative and graded as below.

Grading system for sore throat, hoarseness, and cough 1 hour to 24 hours after surgery

Sore throat

0 No sore throat

1 Mild (less than what is seen in common cold)

2 Moderate (like what is seen in common cold)

3 Severe (more than what is seen in common cold)

Hoarseness

0 No hoarseness

1 Mild (no hoarseness in the time of interview but had it previously)

2 Moderate (only is felt by the patient)

3 Severe (recognizable in the time of interview)

Cough

0 No cough

1 Mild (less than what is seen in common cold)

2 Moderate (like what is seen in common cold)

3 Severe (more than what is seen in common cold)

Data analysis:

The statistical analysis of this prospective study performed with the statistical package for social sciences (SPSS) 20.0 and Microsoft Excel 2013.

Numerical data described as mean and standard deviation, Analysis of variance (ANOVA) used for comparison among study groups. Categorical data were described as count and percentage. Chi-square test or fisher exact test used to estimate the association between variables. The lower level of accepted statistical significant difference is bellow or equal to 0.05.

Results:

This study included 51 patients, Divided into three groups, 17 for each group all of them met the inclusion criteria of the study. Patients were able to complete the entire study and their data were included in the final analysis. There is no statistical difference in patient's characteristics (Age, weight, duration of operation, mean arterial pressure, heart rate and size of ETT) with p value 0.332, 0.847, 0.271, 0.120, 0.283 and 0.310 respectively in all groups. Regarding Type of surgery and ASA show, there are no statistical difference between type of surgery, ASA in all groups with p value 0.058 and 0.396 respectively.

Table 1: Patient Characteristics

		Range	Mean	P value
Age	Ns. (n=17)	26-65	43.06±11.95	0.332NS
	Betamethasone (n=17)	11-65	44.71±13.67	
	Lidocaine (n=17)	26-55	39.00±7.77	
	Total (n=51)	11-65	42.25±11.43	
Weight	Ns. (n=17)	65-135	86.35±17.12	0.847 NS
	Betamethasone (n=17)	40-145	87.82±21.18	
	Lidocaine (n=17)	50110	84.35±13.76	
	Total (n=51)	40-145	86.18±17.32	

Duration	Ns. (n=17)	60-120	78.82±24.97	0.271 NS
	Betamethasone (n=17)	45-90	74.41±16.38	
	Lidocaine (n=17)	45-120	67.35±19.54	
	Total (n=51)	45-120	73.53±20.74	
MAP	Ns. (n=17)	86-134	100.53±11.03	0.120 NS
	Betamethasone (n=17)	75-115	97.41±10.69	
	Lidocaine (n=17)	79-105	93.71±5.67	
	Total (n=51)	75-134	97.22±9.68	
HR	Ns. (n=17)	71-115	85.53±10.70	0.283 NS
	Betamethasone (n=17)	68-110	86.71±11.46	
	Lidocaine (n=17)	60-100	81.12±9.79	
	Total (n=51)	60-115	84.45±10.73	
Size	Ns. (n=17)	7-8	7.47±0.33	0.310 NS
	Betamethasone (n=17)	7-8	7.59±0.32	
	Lidocaine (n=17)	7.5-8	7.62±0.22	
	Total (n=51)	7-8	7.56±0.29	

During recovery phase the incidence of spasm was highest in group C (23.53%) while in group A was lowest (0%) . in group B was 5.88 % with p value 0.049 .The incidence of cough was lowest in group B (11.67 %) rather than other groups. In group A incidence of cough was (41.18%) and was highest in group C (64.71%). with significant p value 0.006.Incidence of hoarseness of voice was highest in group C (47.06%) and the same in both group A and B (5.88%). With p value 0.002. There is no statistical significance between all groups regarding incidence of bucking, Nausea & vomiting. With p value more than 0.05.

Table 2: Type of surgery and ASA

	Type	Ns.	Betamethasone	Lidocaine	P value
ASA	1	17 (100)	12 (70.59)	14 (82.35)	0.058NS
	2	0 (0)	5 (29.41)	3 (17.65)	
Surgery	breast mass	1 (5.88)	1 (5.88)	0 (0)	0.396
	herniaotomy	0 (0)	5 (29.41)	2 (11.76)	
	Hydrocele	0 (0)	0 (0)	1 (5.88)	
	lab coli	10 (58.82)	7 (41.18)	12 (70.59)	
	mastectomy	1 (5.88)	1 (5.88)	1 (5.88)	
	pelvic mass	2 (11.76)	1 (5.88)	0 (0)	
	Hysterectomy	2 (11.76)	2 (11.76)	0 (0)	
	thyroidectomy	1 (5.88)	0 (0)	1 (5.88)	

Table 3: incidence of bucking, nausea and vomiting, cough, spasm and hoarseness of voice

	Groups	NS.	Betamethasone	Lidocaine	P value
Spasm	No	13 (76.47)	16 (94.12)	17 (100)	0.049*
	Yes	4 (23.53)	1 (5.88)	0 (0)	
Bucking	No	14 (82.35)	13 (76.47)	14 (82.35)	0.884NS
	Yes	3 (17.65)	4 (23.53)	3 (17.65)	
Nausea & vomiting	No	12 (70.59)	12 (70.59)	14 (82.35)	0.582NS
	Yes	5 (29.41)	5 (29.41)	3 (17.65)	
Cough	No	6 (35.29)	15 (88.24)	10 (58.82)	0.006*
	Yes	11 (64.71)	2 (11.76)	7 (41.18)	
Hoarseness of voice	No	9 (52.94)	16 (94.12)	16 (94.12)	0.002*
	Yes	8 (47.06)	1 (5.88)	1 (5.88)	

NS: none statistical significance ($p>0.05$).

*: Statistical significant difference ($p<0.01$)

The incidence of sore throat (ST) After one hour from surgery was highest in Group C (Severe 11.8%, moderate 17.6%, mild 70.6 and 0% no sore throat) while in the Group B was lowest (severe 0%, moderate 0%, mild 11.8% and no sore throat 88.2%) . in group A the incidence was (severe 0%, moderate 5.9% , mild 52.9% and no sore throat 41.2%) . p value > 0.001. After six hour from surgery The incidence of sore throat was highest in group C (moderate 5.9%, mild 82.4% , no sore throat 11.8%) , while was lowest in group B (moderate 0%, mild 11.8% , no sore throat 88.2%) . In group A was (moderate 0%, Mild 17.6% and no sore throat 82.4%).p value > 0.001. After 12th hour from surgery The incidence of sore throat was highest in group C (moderate 5.9%, mild 47.1% , no sore throat 47.1%) , while was lowest in group B (moderate 0%, mild 0% , no sore throat 100 %) . In group A was (moderate 0%, Mild 11.8% and no sore throat 88.2%). P value 0.003.

The incidence of hoarseness of voice After one hour from surgery was highest in Group C (moderate 47.1%, mild 29.4% and 47.1% no hoarseness of voice) while in the Group B was lowest (moderate 0%, mild 5.9% and no hoarseness of voice 94.1%) . in group A the incidence was moderate 0% , mild 23.5% and no hoarseness of voice 76.5%) . not significant p value 0.01 . After six hour from surgery The incidence of hoarseness of voice was highest in group C (mild 17.6%, no hoarseness of voice 82.4%), while was lowest in group B (mild 5.9%, no hoarseness of voice 94%). In group A was (Mild 0% and no hoarseness of voice 100%). Not significant p value 0.150.After 12th hour from surgery the incidence of hoarseness of voice was highest in group C (mild 11.8%, no hoarseness of voice 88.2%), while was lowest in group B and A (mild 0%, hoarseness of voice 100 %). In group A was (Mild 0% and no hoarseness of voice 100%). Not significant p value 0.125.

Table 4: incidence of sore throat

Sore Throat (ST) Nil		Groups			P value
		Betamethasone	Xylocaine		
1 hr.	no ST	0	15	7	<0.001
	%	0.0%	88.2%	41.2%	
	Mild ST	12	2	9	
	%	70.6%	11.8%	52.9%	
	Moderate ST	3	0	1	
	%	17.6%	0.0%	5.9%	
	Severe ST	2	0	0	
	%	11.8%	0.0%	0.0%	
	Total	17	17	17	
	%	100.0%	100.0%	100.0%	
6 hr.	no ST	2	15	14	<0.001
	%	11.8%	88.2%	82.4%	
	Mild ST	14	2	3	
	%	82.4%	11.8%	17.6%	
	Moderate ST	1	0	0	
	%	5.9%	0.0%	0.0%	
	Total	17	17	17	
	%	100.0%	100.0%	100.0%	
12 hr.	no ST	8	17	15	0.003
	%	47.1%	100.0%	88.2%	
	Mild ST	8	0	2	
	%	47.1%	0.0%	11.8%	
	Moderate ST	1	0	0	
	%	5.9%	0.0%	0.0%	
	Total	17	17	17	
	%	100.0%	100.0%	100.0%	

Table 5: Incidence of hoarseness of voice

NS.	Hoarseness of voice (HOV)	Groups			p value
		Betamethasone	Lidocaine		
1hr.	No HOV	8	16	13	0.010
	%	47.1%	94.1%	76.5%	
	Mild	5	1	4	
	%	29.4%	5.9%	23.5%	
	Moderate	4	0	0	
	%	23.5%	0.0%	0.0%	
	Total	17	17	17	
	%	100.0%	100.0%	100.0%	
6hr.	No HOV	14	16	17	0.150
	%	82.4%	94.1%	100.0%	
	Mild	3	1	0	
	%	17.6%	5.9%	0.0%	
	Total	17	17	17	
	%	100.0%	100.0%	100.0%	
12 hr.	No HOV	15	17	17	0.125
	%	88.2%	100.0%	100.0%	
	Mild	2	0	0	
	%	11.8%	0.0%	0.0%	
	Total	17	17	17	
	%	100.0%	100.0%	100.0%	

The incidence of cough After one hour from surgery was highest in Group C (severe 11.8%, moderate 23.5%, mild 29.4% and 35.3 % no cough) while in the Group B was lowest (severe 0%, moderate 5.9%, mild 5.9% and no cough 88.2%). in group A the incidence was severe 0% moderate 0%, mild 23.5% and no cough 76.5%). not significant p value 0.015. After six hour from surgery the incidence of cough was highest in group C (mild 47.1%, no cough 52.9%), while was lowest in group B (mild 0%, no cough 100%). In group A

was (Mild 0% and no cough 100%). significant p value 0.001.After 12th hour from surgery the incidence of cough was highest in group C (mild 29.4%, no cough 70.6%), while was lowest in group B and A (mild 0%, no cough 100 %). In group A was (Mild 0% and no cough 100%). significant p value 0.004.

Table 6: Incidence of cough

NS	Cough	Groups			P value
		Betamethasone	Lidocaine		
1hr.	No cough	6	15	13	0.015
	%	35.3%	88.2%	76.5%	
	Mild	5	1	4	
	%	29.4%	5.9%	23.5%	
	Moderate	4	1	0	
	%	23.5%	5.9%	0.0%	
	Severe	2	0	0	
	%	11.8%	0.0%	0.0%	
	Total	17	17	17	
	%	100.0%	100.0%	100.0%	
6 hr.	No cough	9	17	17	<0.001
	%	52.9%	100.0%	100.0%	
	Mild	8	0	0	
	%	47.1%	0.0%	0.0%	
	Total	17	17	17	
	%	100.0%	100.0%	100.0%	
12 hr.	No cough	12	17	17	0.004
	%	70.6%	100.0%	100.0%	
	Mild	5	0	0	
	%	29.4%	0.0%	0.0%	
	Total	17	17	17	
	%	100.0%	100.0%	100.0%	

Discussion

Sore throat, cough and hoarseness of voice are a common complication after surgeries involving induction of general anesthesia. During tracheal intubation, trauma, irritation and inflammation of the laryngeal mucosa are considered to be the responsible factors for the development of post-operative sore throat , cough and hoarseness of voice (Fayyaz *et al.,* 2017). Patient characteristic (age, weight, Duration of surgery, MAP heart rate, size of ETT) showing no significant differences between the three treatment groups as seen in table?, P – value for age, weight, duration of surgery, MAP, Heart rate and size of ETT were 0.332, 0.847, 0.271, 0.120, 0.283, 0.310 respectively and all of them more than 0.05.Similarly, the ASA and type of surgery showing p-value of 0.058, 0.396.

On recovery the incidence of spasm in group A was 0 %, while in group B was 5.88% and in group C was 23.35%. With a significant p value less than 0.05. This is may be due to a local anesthetic effect of Lidocaine. The incidence of cough was lowest in group B (11.67 %) rather than other groups. In group A incidence of cough was (41.18%) and was highest in group C 64.71%. with significant p value less than 0.05. This is due to local anesthetic effect of Xylocaine and anti-inflammatory effect of betamethasone. Incidence of hoarseness of voice was highest in group C (47.06%) and the same in both group A and B (5.88%). There is no statistical significance between all groups regarding incidence of bucking, Nausea & vomiting. With p value more than 0.05.

After one hour from surgery the incidence of sore throat was highest in Group C while in the Group B was lowest. in group A the incidence was (severe 0%, moderate 5.9% , mild 52.9% and no sore throat 41.2%) . p value > 0.001

.After six hour from surgery The incidence of sore throat was highest in group C, while was lowest in group B . In group A was (moderate 0%, Mild 17.6% and no sore throat 82.4%).p value > 0.001. After 12th hour from surgery the incidence of sore throat was highest in group C, while was lowest in group B. In group A was (moderate 0%, Mild 11.8% and no sore throat 88.2%). P value 0.003.

Incidence of hoarseness of voice after one hour from surgery was highest in Group C while in the Group B was lowest. in group A the incidence was moderate 0% , mild 23.5% and no hoarseness of voice 76.5%) . not significant p value 0.01 . After six hour from surgery the incidence of hoarseness of voice was highest in group C while was lowest in group B. In group A was (Mild 0% and no hoarseness of voice 100%). Not significant p value 0.150.After 12th hour from surgery the incidence of hoarseness of voice was highest in group C, while was lowest in group B and A. In group A was (Mild 0% and no hoarseness of voice 100%). Not significant p value 0.125.

Incidence of cough after one hour from surgery was highest in Group C while in the Group B was lowest. in group A the incidence was severe 0% moderate 0% , mild 23.5% and no cough 76.5%) . Not significant p value 0.015. After six hour the incidence of cough was highest in group C, while was lowest in group B and A. Significant p value 0.001. After 12th hour from surgery the incidence of cough was highest in group C. while was lowest in group B and A (mild 0%, no cough 100 %). In group A was (Mild 0% and no cough 100%). significant p value 0.004.

Nadia *et al.*, Ninety women with an ASA I or II and undergoing elective mastoidectomy were randomized into three groups of 30 patients. The endotracheal tubes in each group were sprayed with 50% Beclomethasone,

10% Lidocaine hydrochloride, or normal saline (control group) before endotracheal intubation. Patients were examined for sore throat (none, mild, moderate, or severe), cough, and hoarseness at 1 and 24 h after extubation. This study agreed with our study by Showing the incidence bucking, spasm was not significantly different among the groups in the present study (Ayoub *et al.* , 1998).

Parineeta *et al.,* 120 ASA I and II patients undergoing elective surgery under general anesthesia with endotracheal intubation. Patients were divided into three groups of 40 patients each. Endotracheal tube used for patients in group C was unlibricated, while that for group B and group L were lubricated betamethasone gel or 2% Lidocaine jelly respectively. Incidence and severity of postoperative sore throat, hoarseness and cough were observed. This study agreed with our study by showing Severity of postoperative sore throat at all times was less with betamethasone compared with Lidocaine and control group. This may be due to the prolonged anti-inflammatory action of betamethasone gel (Ayoub *et al.,* 1998).

Ayoub *et al.,* With institutional review board approval, written, informed consent was obtained from 87 ASA physical statuses I-III patients scheduled for elective surgery under general endotracheal anesthesia with propofol and a non-depolarizing relaxant. Subjects were informed that we would be inquiring about ST, C, and H. Exclusion criteria included operations involving the head and neck, anticipated rapid-sequence induction or airway difficulty, and patients who were ~16 yr old or who were using steroids preoperatively. Patients were randomly assigned so that before intubation, the endotracheal tube was lubricated uniformly by a un blind investigator from the cuff to the 15-cm mark with 3 mL of a water-soluble gel containing

chlorhexidine gluconate alone or with the addition of betamethasone 0.05% (equivalent to 3 mg of prednisone). Proving that widespread application of betamethasone gel significantly reduces the incidence of postoperative hoarseness of voice. This is disagreed with our study. The beneficial effect of Betamethasone gel application was observed in subsequent studies because of wide spread application of betamethasone gel to all portions of the tube that came in contact with the posterior pharyngeal wall, vocal cords, and trachea and not just confined to the tip and cuff of the tracheal tube (Sumathi *et al.,* 2008) .

One hundred patients (ASA I-II) to undergo Endo tracheal intubation, were randomly divided equally into two groups; 50 Case (Group A). 50 Control (Group B). The tracheal tubes for Case Group A were lubricated with 0.05% betamethasone gel and for the Control Group B with KY gel. Patients were interviewed at end of Procedures and 1 and 24 hour after extubation. Showing The incidence and severity of sore throat, hoarseness and cough, 1 and 24 hours postoperatively was reduced significantly in Case Group A. So Betamethasone gel, when was used for lubrication of endotracheal tubes pre-operatively, was shown to be effective in decreasing postoperative sore throat, hoarseness, and cough (Yentis, 2007).

This prospective, randomized, double blind, controlled study compares the incidence of postoperative sore throat, cough, and hoarseness of voice after general tracheal anesthesia when applying betamethasone gel (betamethasone group) or Lidocaine jelly (Lidocaine group) on the tracheal tube. One hundred and fifty ASA classes I and II patients undergoing elective surgeries under general oro tracheal anesthesia were randomized into three groups: Betamethasone gel, Lidocaine jelly, and control groups. In the

post-anesthesia care unit (Sumathi *et al.,* 2008). A blinded anesthesiologist interviewed all patients on postoperative sore throat, cough, and hoarseness of voice at 1, 6, 12, and 24 h after operation. Resulted in A wide spread application of betamethasone gel on the tracheal tube decreases the incidence and severity of postoperative sore throat, cough, and hoarseness of voice. (Fayyaz *et al.* , 2017). this clinical study was conducted at the Nishtar Hospital and Medical College, Multan, Pakistan, from July to December 2015, and comprised patients who were set to undergo elective surgery under general anesthesia. The patients were divided into two equal groups. In group 1, endotracheal tube was lubricated with betamethasone

gel (0.05%). In group 2, endotracheal tube was lubricated with 4.0% Lidocaine gel. SPSS 20 was used for data analysis. Generalized estimating equation was used to see the association between the treatment methods and severity of sore throat over time. Resulted in Local application of betamethasone gel was associated with reduced risk of post-operative sore throat as compared to local application of Lidocaine gel on the endotracheal tube.

This was a prospective, randomized, single-blind comparative study carried out among 120 ASA I and II patients aged 18-65 years undergoing elective surgery under general anesthesia with endotracheal intubation. Patients were randomly divided into three groups of 40 patients each. Endotracheal tube used for patients in group C was un lubricated, while that for group B and group L were lubricated up to 15 cm mark with 2.5 ml of 0.05% Betamethasone gel or 2% Lidocaine jelly respectively. Incidence and severity of postoperative sore throat, hoarseness and cough were observed at 1, 6 and 24 h following extubation. Resulted in Wide spread application

of 0.05% betamethasone gel to lubricate the endotracheal tube significantly reduces the incidence and severity of sore throat at 24 h of extubation but not of hoarseness or cough (Thapa *et al*. , 2017).

Conclusion:

Applying Betamethasone and Lidocaine gel on the endotracheal tube is a simple and effective method of reducing the incidence of post-operative laryngeal spasm, sore throat, cough and hoarseness of voice in patients under general anesthesia with endotracheal intubation.

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