



## COMPARISON OF OROPHARYNGEAL PACK SOAKED IN LIGNOCAINE WITH SODABICARBONATE AND LIGNOCAINE WITH DEXAMETHASONE IN PATIENTS UNDERGOING NASAL SURGERIES

### Anaesthesiology

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### ABSTRACT

**Aim:** To study the effectiveness and comparison of combination of lignocaine with sodabarbonate and lignocaine with dexamethasone used in oropharyngeal pack in reducing postoperative sore throat (POST), hoarseness and throat irritation.

**Materials and methods:** Sixty patients undergoing nasal surgeries were randomly allocated into two groups of 30 each. Group LS received lignocaine & sodabarbonate and Group LD received lignocaine & dexamethasone in oropharyngeal packing. Variables were analysed such as vital parameters, incidence of POST, hoarseness and throat irritation.

**Results:** POST, hoarseness and throat irritation were present in 80%, 26.6% & 100% patients in Group LS, and 53.3%, 10% & 70% patients in Group LD respectively. No significant change in hemodynamic parameters was seen in the two groups. As compared to Group LS, Group LD showed a statistically significant decrease in incidence of POST and throat irritation. A decrease in incidence of hoarseness was also seen in Group LD.

**Conclusion:** In Group LD as compared to Group LS, a positive benefit is seen in form of reduction of POST, hoarseness and throat irritation helping in better recovery of patients.

### KEYWORDS

POST, postoperative sore throat, hoarseness, throat irritation, oropharyngeal pack

### INTRODUCTION

Postoperative sore throat (POST) following nasal surgery remains a long-standing concern for anaesthesiologists despite advancement in anaesthetic techniques. POST and hoarseness are the most common though minor adverse event during anaesthesia recovery, second only to postoperative nausea and vomiting<sup>(1)</sup>. The incidence of POST after general anaesthesia varies from institution to institution and has been reported to be up to 90%<sup>(2-7)</sup>. Postoperative hoarseness varies from 4 to 43%<sup>(8,9)</sup>.

Postoperative throat complaints frequently arise after tracheal intubation for general anaesthesia in the first 2 postoperative days. The main symptom reported after tracheal intubation is sore throat, but patients also report hoarseness and throat irritation. Pharyngeal packs are commonly used during oral and ENT (Ear Nose Throat) surgeries to prevent aspiration, tracheal contamination and passage of blood into the stomach. They are disputed to increase the incidence of postoperative sore throat (POST), but are necessary as surgery in and around the oral cavity necessitates them to soak blood and debris that result as consequence of surgery itself as well as to clear the surgical field. There have been previous studies using lignocaine and, or dexamethasone topically in form of spray or as Merozol packs in the pharynx for their analgesic effect and for reducing postoperative sore throat and hoarseness with conflicting results. Our study aimed at finding the effectiveness of combination of lignocaine with soda bicarbonate (sodium bicarbonate) and lignocaine with dexamethasone used topically in form of oropharyngeal pack in reducing POST, hoarseness and throat irritation and comparison of the two combinations.

### MATERIALS & METHODS

This prospective study was conducted at OT Complex in Sri Aurobindo medical college and PG institute after approval by the Institute Ethics Committee and after obtaining written informed consent from the patients. Data was collected from 60 patients undergoing various nasal surgeries like septoplasty, FESS, septo-rhinoplasty etc. These ASA I and II patients were assessed for post-operative haemodynamic changes for set age group. Patients were randomly allocated into the two groups of 30 each. Group LS patients

received 5ml lignocaine 2% + 2ml soda bicarbonate 7.5% in oropharyngeal packing and Group LD patients received 5ml lignocaine 2% + 2ml (8mg) dexamethasone in oropharyngeal packing. Post intubation, patients were orally packed with appropriate oropharyngeal pack using Maggils forceps. After surgery oropharyngeal pack was removed and gentle suction was done. Vitals were noted 5 min before, 5 min and 15 min after extubation. Postoperatively at 30 min, 2hours, 12 hours and 24 hours patients were invited to find out if any sore throat, hoarseness of voice, or throat irritation was present. A person who was blinded to the drug used did the scoring using verbal analogue scale for sore throat with 0 for no sore throat, 1 for mild, 2 for moderate and 3 for severe sore throat.

**Statistical Analysis:** Statistical testing was conducted with the statistical package for the social science system version SPSS 17.0. Continuous variables presented as mean  $\pm$  SD and categorical variables are presented as absolute numbers and percentage. Significance of difference between means was observed by using student t test in case of normal. Chi-square test and Fisher's exact test as appropriate were used to compare sore throat, dysphagia, hoarseness and throat irritation in the two groups. A p value less than 0.05 was taken to indicate a significant difference.

### OBSERVATIONS AND RESULTS

- The age group included in our study was 18 – 55 years. The mean age of patients included in our study was  $34.7 \pm 12.7$  years. The demographic characteristics were similar among the two groups in terms of number of patients (30 each), age, gender and ASA status with p values >0.05.

**Table 1: Demographic characteristics among the two groups**

	Group LS	GroupLD	
Number of patients (n)	30	30	
Age (year)	35.3 $\pm$ 12.3	34.1 $\pm$ 10.1	0.664
Gender			0.795
Male	16(%53.33)	17(%56.67)	
Female	14(%46.67%)	13(%43.33)	
ASA status I/II	23/7	22/8	0.754

Incidence of sore throat in our study in younger age group ( $\leq 35$  years) was 54.55% (18/33) and in older age group ( $>35$  years) was 81.48% (22/27). A significant association was seen between sore throat and age groups with increased incidence of sore throat in older age group as compared to younger age group with p value of 0.028 ( $<0.05$ ). No significant gender difference was seen in incidence of sore throat in this study. In our study weight of the patients in the two groups were noted. Incidence of sore throat in patients less than or equal to 60 kg was 64% (16/25) and in patients more than 60 kg was 69% (24/35). The weight of the patients had a strong positive correlation with the postoperative sore throat with increased incidence of sore throat in patients more than 60 kg when compared to patients less than 60 kg.

Nasal surgeries included in the study were FESS, Excision Biopsy, Septoplasty, Chonchoplasty, Rhinolithectomy, Maxillectomy, Nasal Cyst Excision, Fracture reduction and FESS with Septoplasty in 25, 2, 8, 4, 5, 5, 3, 2 and 6 patients respectively of the total 60 patients. Surgeries involving the oropharynx were excluded to prevent confounding factor of trauma to the oropharynx by means other than those seen in nasal surgeries which is mainly endotracheal tube.

Hemodynamic parameters of systolic blood pressure (SBP), diastolic blood pressure (DBP), pulse rate (PR), respiratory rate (RR) and oxygen saturation (O<sub>2</sub> Sat) were recorded at 5 minutes before extubation and 5 minutes & 15 minutes after extubation, and were assessed for any changes in emergence phenomenon and difference amongst the two groups. No significant difference was found in the hemodynamic parameters in the two groups.

Overall incidence of sore throat in our study population was 66.67% (40/60). Patients were asked to rate their severity of sore throat as no sore throat, mild, moderate and severe at 30 minutes, 2 hours, 6 hours and 24 hours post extubation.

At 30 minutes post extubation incidence of sore throat in group LS was 11/30 patients (36.67%) with 9 patients complaining of mild sore throat and 2 patients complaining of moderate sore throat. In group LD, 9 patients complained of mild sore throat 30 minutes post extubation. At 2 hours post extubation incidence of sore throat in group LS was 13/30 (43.34%) with 11 patients complaining of mild sore throat and 2 patients complaining of moderate sore throat. In group LD, 12/30 (40%) patients complained of mild sore throat 2 hours post extubation. None of the patients in the two groups complained presence of severe sore throat. Statistically no significant association was seen between sore throat and the groups at 30 minutes and 2 hours.

At 6 hours post extubation incidence of mild sore throat in group LS was 12/30 (40%) and in group LD was 4/30 (13.3%). At 24 hours post extubation incidence of sore throat in group LS was 16/30 patients (53.34%) with 14 patients complaining of mild sore throat and 2 patients complaining of moderate sore throat. In group LD 4/30 (13.33%) patients complained of mild sore throat. There was a statistically significant association seen between sore throat and the groups at 6 hours and 24 hours post extubation with decreased incidence of sore throat seen in group LD as compared to group LS.

In total, 24/30 (80%) patients in group LS reported sore throat, mild or moderate and 16/30 (53.33%) patients in group LD reported mild sore throat at some point of time post extubation. There was a statistically significant association seen between sore throat and the groups,  $p=0.028$  ( $P<0.05$ ), showing a higher proportion of sore throat in the group LS in comparison to group LD.

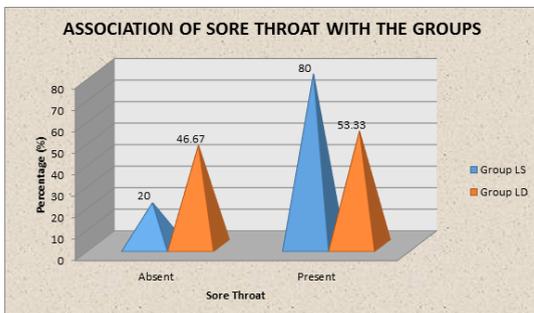


Fig 1: Pyramid diagram showing the association of sore throat with the groups

All the patients were examined for hoarseness of voice at 30 minutes, 2 hours, 6 hours and 24 hours post intubation, they were also asked if they themselves had observed any change in voice at these point of time post extubation. Incidence of hoarseness in the group LS was 26.67% (8/30) and in the group LD was 10% (3/30) with overall incidence being 11/60 (18.33%). Statistically no significant association was seen between hoarseness of voice and the groups with p value of 0.095 ( $P>0.05$ ).

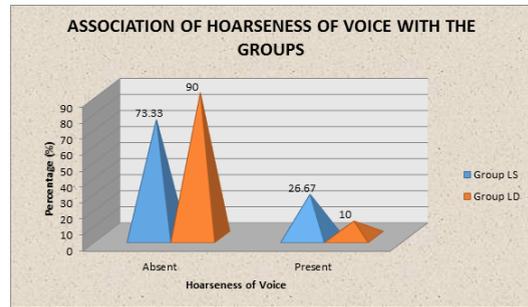


Fig 3: Pyramid diagram showing the association of throat irritation with the groups

DISCUSSION

Even though postoperative sore throat, throat irritation and hoarseness are minor adverse events during anesthesia recovery but are the most common second only to postoperative nausea and vomiting in ENT surgeries causing significant patient distress in the postoperative period.

Several studies have been done to study the effect of various drugs including local anaesthetics, non-steroidal anti-inflammatory drugs and steroids individually and in various combinations typically in form of spray, gel or in nasal or pharyngeal packs with combination of drugs aiming to obtain the maximum benefit with minimum dose and to minimize the complications<sup>(13-22)</sup>. These studies have shown conflicting results.

A significantly increased incidence ( $p<0.05$ ) of sore throat was seen in older age group as compared to younger age group in this study. Many studies found that the incidence of postoperative sore throat did not correlate with the age of the patient<sup>(7,14,30-33)</sup>. But Sprague *et al* have found that the postoperative sore throat incidence was greater in the under forty age group than in the older group<sup>(34)</sup>. Thus conflicting results have been seen the various studies in terms of incidence of sore throat with respect to age of patient.

There was statistically no significant difference in incidence of sore throat in the male and female population of the study group with a calculated p value of 0.581 ( $P>0.05$ ). Our results are similar to results obtained in the study Kadar MA *et al.* who also found no significant gender difference in incidence of sore throat and hoarseness<sup>(30)</sup>. In a study done by Valentine *et al.*, their data did not show any gender difference in the incidence of post intubation sore throat<sup>(7)</sup>. Similarly in study by Hakim M *et al.* no gender difference was seen in incidence of sore throat<sup>(14)</sup>. Several studies have shown that female patients tend to have more postoperative sore throat compared to males<sup>(2,3,5,8,31,32,35-37)</sup>. Again conflicting results have been obtained in various studies in terms of incidence of sore throat with respect to gender of patient.

The weight of the patients had a strong positive correlation with the postoperative sore throat with a correlation coefficient of 1. The results were comparable to those found in study by Kadar MA *et al.*<sup>(30)</sup>. In their study they found increased incidence of sore throat in patients more than 60 kg when compared to patients less than 60 kg. Increased incidence of postoperative sore throat in heavier patients was also seen in studies by Jones *et al* and Hahnel *et al*<sup>(32,38)</sup>. They had attributed this to greater technical difficulty in intubating obese patients.

Hemodynamic parameters of systolic blood pressure (SBP), diastolic blood pressure (DBP), pulse rate (PR), respiratory rate (RR) and oxygen saturation (O<sub>2</sub> Sat) were recorded at 5 minutes before extubation and 5 minutes 15 minutes after extubation, and were assessed for any changes in emergence phenomenon and difference amongst the two groups. No significant difference was found in the hemodynamic parameters in the two groups in relation to the drugs

used to soak the oropharyngeal packs at any point of time. Similarly, there was no significant difference between the studied groups in measured hemodynamic indices (SBP, DBP, or HR) in the study by Tabari et al. in which the three groups comprised of 75 patients who were given betamethasone gel, 75 patients IV dexamethasone and 75 patients as the control group<sup>(39)</sup>.

Overall incidence of sore throat in our study population was 66.67% (40/60). It was comparable to study by Winkel et al<sup>(8)</sup> in which they studied the effects on the incidence of postoperative sore throat of 1 percent cinchocaine jelly for endotracheal intubation. In their study incidence of post-operative sore throat was 68.5%. In several studies incidence of sore throat has been seen to vary from 15% to 90% patients depending on various factors<sup>(6,8,11,12,40-46)</sup>.

Patients were asked to rate their severity of sore throat as no sore throat, mild, moderate and severe at 30 minutes, 2 hours, 6 hours and 24 hours post extubation. There was a statistically significant association seen between sore throat and the groups,  $p=0.028$  ( $P<0.05$ ), showing a higher proportion of sore throat in the Group LS in comparison to the Group LD. Thus it is observed that combination of lignocaine with dexamethasone is more effective in preventing postoperative sore throat as compared to lignocaine and soda bicarbonate. Also, reduced severity of postoperative sore throat is seen in patients receiving lignocaine and dexamethasone as none of the patients in this group complained of moderate sore throat of the total of 16 patients out of 30 complaining of sore throat. While in the group LS 2 out of 24 patients complained of moderate sore throat at some point of time post extubation.

The incidence of hoarseness in the group LS was 26.67% (8/30) and in the group LD was 10% (3/30) with overall incidence being 11/60 (18.33%). These results are comparable to the results in the study "Assessment of the efficacy of dexamethasone, lignocaine or placebo in the prevention of post intubation sore throat" by Kadar MA et al.<sup>(30)</sup>. In their study they found an incidence of hoarseness of 18% in the placebo/control group, 20% in the group who received topical lignocaine and 23% in the group who received topical dexamethasone with a calculated  $p$  value of 0.676 ( $p>0.05$ ) showing no significant difference in the incidence of hoarseness in the three groups.

There was statistically no significant association seen between the hoarseness of voice and the groups with  $p$  value of 0.095 ( $P>0.05$ ), showing no significant difference in incidence of hoarseness was seen in the two groups.

There was a statistically significant association seen between the throat irritation and the groups with  $p$  value of 0.001 ( $P<0.05$ ), showing a higher number of patients with throat irritation in Group LS in comparison to the group LD. Also a decrease in incidence of throat irritation is seen in group LD with the passage of time. Thus emphasizing on the importance of the combination of lignocaine and dexamethasone in decreasing the throat irritation and helping in better postoperative recovery of the patients as compared to combination of lignocaine and soda bicarbonate.

We too in our study found that there is a significant decrease in incidence of sore throat in group LD in nasal surgeries as compared to group LS with the aim to increase the efficacy of lignocaine with soda bicarbonate. While lignocaine is a local anaesthetic and with intermediate duration of efficacy, it penetrates the tissues rapidly and thus penetration into the tissues can be further increased by combining it with soda bicarbonate<sup>(16)</sup>.

Dexamethasone and such steroids have been known to have analgesic and anti-emetic as well as strong anti-inflammatory characteristic<sup>(23-25)</sup>. Increased effectiveness of dexamethasone has been seen in many studies when used in combination with local anaesthetics such as lignocaine, levobupivacaine, mepivacaine etc.<sup>(15,23,26,27,29)</sup>.

Yildiz I et al. had observed that lignocaine or dexamethasone infiltrated in Merocel pack provides analgesic effect following septoplasty and total analgesic consumption is reduced when dexamethasone is combined with lignocaine<sup>(47)</sup>. We too in our study found a significant decrease in incidence of sore throat in group LD as compared to group LS with the aim to increase the efficacy of lignocaine with sodium bicarbonate.

Tabari et al. had concluded in their study that betamethasone gel was more effective in preventing sore throat incidence and severity in the 24th hour postoperatively and needed a 24 hour period to manifest itself<sup>(39)</sup>. Similar results were obtained by Kazemi and Amini, as they considered betamethasone gel in reducing sore throat, cough, and hoarseness after tracheal intubation<sup>(48)</sup>. We too in our study found a decreasing incidence of sore throat in the group LD in form of infiltration into oropharyngeal pack during nasal surgeries with time i.e. less incidence of sore throat at 24 hr and 6 hr as compared to 30 minutes and 2 hours post extubation. This finding can be attributed to the fact that topical steroids have an anti-inflammatory effect as well as analgesic effect. In the early post-operative period steroids provide analgesia as well as reduce inflammation caused by intubation or other trauma caused during surgery and as the inflammation is reduced, the pain caused by this inflammation is reduced in the late postoperative period. Thus, use of topical steroid mitigates POST and is more effective in preventing its incidence and severity in the 24th hour.

In conclusion, in patients receiving lignocaine and dexamethasone in their oropharyngeal packs during nasal surgeries as compared to lignocaine and soda bicarbonate, a positive benefit is seen in form of reduction of postoperative sore throat, hoarseness and throat irritation helping in better recovery of patients.

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