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Original Article

Efficacy of 2% Lignocaine Gel Applied to Throat Pack in Preventing Sore Throat Following Surgery in Patients Undergoing Nasopharyngeal Surgery

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ABSTRACT

Objective: To compare the efficacy of 2% Lignocaine gel applied to throat pack with 0.9% Normal Saline in preventing sore throat postoperatively in patients undergoing nasopharyngeal procedures.

Study Design: Quasi Experimental

Place and Duration of Study: Department of Anesthesiology Combined Military Hospital Multan, Pakistan from Sep 2023 to Feb 2024.

Methodology: One hundred and twenty patients undergoing nasopharyngeal surgeries were allocated randomly in two groups, Group-X throat pack with Lignocaine gel 2% (n= 60) and Group-Y throat pack with Normal Saline (n= 60). Sore throat score was assessed at 12 hour and 24 hours postoperatively and compared between the two groups. Quantitative variables were calculated as Mean and standard deviation, while frequency and percentages were shown for categorical variables. Independent samples t- test was used to compare means and Chi square test was utilized for qualitative variables. The value of 'p' less than or equal to 0.05 was considered statistically significant.

Results: The mean sore throat score in Group-X and Group-Y were at 12 hours, 0.63 ± 1.05 cm and 4.45 ±2.51 cm (p Value < 0.05) postoperatively respectively. Similarly mean sore throat score in Group-X and Group-Y were at 24 hours, 0.80 ± 0.91 cm and 6.05±2.43 cm post-operatively (p value < 0.05). In Group-X, 07 (11.7%) patients developed hoarseness and in Group-Y, hoarseness developed in 16(26.7%) patients respectively.

Conclusion: The patients managed with oropharyngeal packing mix with 2 % Lignocaine gel developed less sore throat following surgeries and ultimately reduced perioperative morbidity.

Keywords: Hoarseness, Lignocaine, Oropharynx, Sore throat

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INTRODUCTION

Patients undergoing oronasal and maxillofacial surgeries frequently have oropharyngeal packing and its use can affect postoperative outcomes, particularly the incidence of sore throat following surgery. By keeping away saliva, blood and other fluids, the oropharyngeal packing helps in protection of the airway during the surgery.[1] The oropharyngeal packing protects the airway by removing the secretions, prevents aspiration of blood or secretions into the airway and also provides a better view for the surgeon.[2] On the other hand, using oropharyngeal packing may results in postoperative complications including sore throat, hoarseness, difficulty in swallowing.[3] The postoperative sore throat may results from mechanical trauma caused by oropharyngeal packing.[4]

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Following general anesthesia, use of pharyngeal packing mix with or without Lignocaine gel 2 % had incidence of sore throat varies from 14% to 37%.[5] There are number of variables that can raise the risk of sore throat, such as endotracheal tube cuff pressure, diameter of the endotracheal tube, the airway suctioning pressure and the length of the procedure.[6] The sore throat, throat irritation and hoarseness are the most common symptoms following general anesthesia.[7]

Use of Lignocaine gel on the oropharyngeal pack is a standard practice to reduce the frequency of sore throat postoperatively.[8] A local anesthetic, Lignocaine may help to lessen the irritation and discomfort in the oropharynx. The gel is easily applied to the oropharyngeal pack, and it has potential to numb the area, and may can lessen the sensation of pain or soreness.[9]

Numerous studies demonstrated that how well Lignocaine gel applied to the throat pack reduced sore throat following surgery. The results have been

inconsistent, although some studies have shown a significant reduction in incidence of sore throats, other research has only found modest benefits in this area. The effectiveness of the treatment may depend on number of variables such as Lignocaine concentration, application time and duration, and surgical features.[10]

The rationale of this study is to prevent post-operative morbidity and ultimately reduction in hospital stay of the patients by using oropharyngeal pack impregnated with Lignocaine gel 2%.

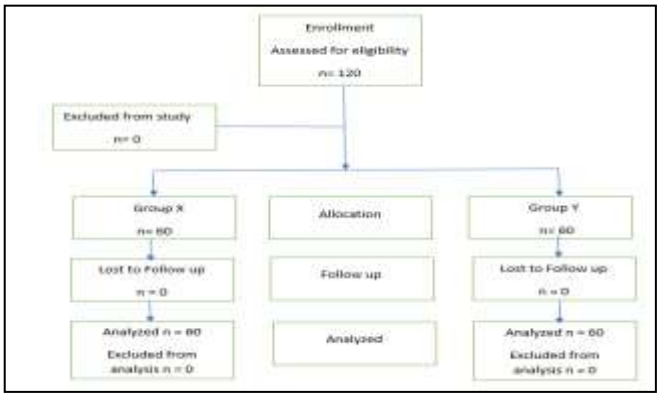

Figure: Patient Flow Diagram (n=120)

METHODOLOGY

This Quasi experimental study was conducted in the Department of Anesthesiology CMH Multan, Pakistan from August 2023 to January 2024. The total duration of the study was six months. The sample size was calculated using the WHO sample size calculator with an absolute precision of 0.05 and the power of 90% for the test. In Group-X (throat pack soaked with Lignocaine) and in Group-Y (throat pack with Normal Saline), the absolute population proportions suffering sore throat were 0.14 and 0.37 respectively.5 In each group calculated sample size (n) was 60. Following written informed consent and institutional review board approval (vide ERC No 215/23 dated 1St June 2023), 120 patients between the ages of 20 to 60 years requiring oropharyngeal throat packing during the surgeries were recruited in this study. The method of sampling was non-probability consecutive sampling.

Inclusion Criteria: Patients between the ages of 20 to 60 years of either gender having American society of anesthesiologist class II and III, who needed oropharyngeal throat packing during the surgeries (ENT, FESS, Dental and maxillofacial) were recruited in this study.

Exclusion Criteria: Patients with known history of coagulopathies, allergy or sensitivity to local anesthetic (Lignocaine), anticipated difficult Intubation, emergency surgeries, airway anomaly, American society of anesthesiologist class IV and children under 12 years of age were excluded.

Two groups of the patients were created by computer generation. The oropharynx in Group-X (TPX) packed with throat pack soaked in Normal Saline mix with 2% Lignocaine gel and in Group-Y (TPY) oropharynx packed with throat pack soaked with Normal Saline only. Prior to induction, patients received IV Ondansetron 04 mg and injection Nalbuphine 0.1 mg/kg. Induction of general endotracheal anesthesia was with injection Propofol 2-2.5 mg/kg and injection Atracurium 0.5mg/kg intravenously. Airway was secured with endotracheal tube and anesthesia was provided with inhaled anesthetics (Isoflurane MAC) with oxygen. Mechanical ventilation was managed with synchronized intermittent mandatory ventilation mode.

Group-X (TPX) patients had their oropharynx packed with role gauze pack soaked with Normal Saline mix with 2% Lignocaine gel, similarly oropharynx of the Group-Y (TPY) patients packed with gauze pack soaked with Normal Saline solely and this was all done by using laryngoscope under direct visualization with the aid of Magill's forceps after securing the airway. In both the groups, at the end of surgical procedure, the throat pack was removed under direct visualization and airway was thoroughly suctioned while limiting the suction pressure at 150 mmHg. According to the sore throat severity score, the post-operative sore throat was classified on visual analog scale (VAS) as follows, 0= no sore throat, 1-3=mild sore throat (Patient complains of sore throat only on asking), 4-7= moderate sore throat (Patient complains of sore throat on his/her own), and 8-10 = severe throat score (Throat pain with change of voice or hoarseness) and hoarseness as, 1= No hoarseness, 2= hoarseness. In each group, following surgery the assessment of sore throat was carried out at 12 and 24 hours respectively. In each group, the assessment of hoarseness was measured 24 hours after surgery.

Statistical Package for Social Sciences (Ver.22) was used to analyzed data. For quantitative variables, mean and standard deviation were calculated, whereas frequency and percentages were used to present categorical variables. Independent samples t-test was used to compare means and the Chi square utilized for qualitative variables. The value of 'p' less

than or equal to 0.05 was considered statistically significant.

RESULTS

Mean age in Group-X(TPX) and Group-Y (TPY) were 40.50±9.59 and 40.20 ± 11.07 years respectively. The mean Weight in Group-X and Y were 63.98 ± 8.07 kg and 65.67 ± 6.61 kg. In Group-X, male to female ratio of patients were 55% (n=60) and 45% (n=60), similarly in Group-Y were 50 % (n=60) and 50% (n=60). (Table-I) The distribution of the cases in Group X and Y were as showed in Table-II. In Group-X, patients suffered no sore throat were 39(60%), mild sore throat 19(31.5%), moderate sore throat 02(3.5%) and severe sore throat 0 and in Group-Y suffered no sore throat were 04(6.5%), mild sore throat 25(42%), moderate sore throat 24(40%) and severe sore throat 07(11.5%) at 12 hours while at 24 hours Group-X, patients suffered no sore throat were 29(48.4%), mild sore throat 31 (51.6%), moderate and severe sore throat were 0 and Group-Y suffered no sore throat were 03(5%), mild sore throat 06(10%), moderate sore throat 32 (53.3%) and severe sore throat 19(31.6%) . In Group-X patient suffered no hoarseness were 53(88.3%) and developed hoarseness 07(11.7%) and in Group-Y suffered no hoarseness 44(73.3%) and hoarseness 16(26.7%) respectively. (Table-III)

Table-I: Patient Demographic Data (n =120)

Parameters (n=120)	Group-X (TPX) (n=60)	Group-Y (TPY) (n=60)
Age(Mean+SD)	40.50±9.59	40.20 ± 11.07
Weight(Mean+SD)	63.98 ± 8.07	65.67 ± 6.61
Gender Male Female	33(55.0%) 27(45.0%)	30(50.0%) 30(50.0%)

Table-II – Distribution of Cases in both Groups (n=120)

Distribution of cases	Group (X) Throat Pack with Lignocaine (n=60)	Group (Y) Throat Pack Only (n=60)	Total (n=120)
Dental	16(26.64%)	24(40.00%)	40(33.33%)
DNS	09(15.00%)	04(6.63%)	13(10.84%)
FESS	10 (16.60%)	04(6.60%)	14(11.62%)
Tonsillectomy	19(31.61%)	12(20.00%)	31(25.84%)
Maxillofacial	06(10.00%)	16(26.65%)	22(18.42%)
Total	60(100.00%)	60(100.00%)	120(100.00%)

The mean sore throat score in Group-X and Group-Y were at 12 hours, 0.63 ± 1.05 cm and 4.45 ±2.51 cm postoperatively (*p* Value < 0.001) respectively. Similarly mean post-operative sore throat score in Group-X and Group-Y were at 24 hours, 0.80 ± 0.91 cm and 6.05 ± 2.43 cm (*p* value < 0.001). Table-IV

We also checked normality of continuous variables of our data by Shapiro-Wilk test where the p-values of all the continuous variables were assessed. The p value of age and weight were 0.497 and 0.007, hence normally distributed. The p value of sore throat score at 12 and 24 hours were < 0.001 and hence showed skewed distribution.

Table-III Severity of Post-operative Sore Throat and Hoarseness in both groups (n=120)

Parameter	Group-X Throat Pack with Lignocaine (n=60)	Group -Y Throat Pack Only (n=60)	Total (n=120)
Sore Throat At 12 Hour No Sore Throat Mild Sore Throat Moderate Sore Throat Severe Sore Throat	 39 (65.00%) 19 (31.50%) 02 (3.50%) 0	 04 (6.50%) 25 (42.00%) 24 (40.00%) 07 (11.50%)	 43 (35.80%) 44 (36.60%) 26 (21.66%) 07 (5.80 %)
Sore Throat At 24 Hour No Sore Throat Mild Sore Throat Moderate Sore Throat Severe Sore Throat	 29(48.0%) 31(51.66%) 0 0	 03(5.0%) 06(10.0%) 32(53.34%) 19(31.66%)	 32 (53.33%) 37(61.64%) 32(53.33%) 19(31.60%)
Post-Operative Hoarseness No Yes	 53 (88.34%) 07 (11.72%)	 44 (73.30%) 16 (26.70%)	 97 (80.84%) 23 (19.16%)

Table-IV: Mean Post-operative Sore throat Score in both groups (n=120)

Group Type	Throat Pack with Lignocaine (n=60)	Throat Pack Only (n=60)	*p*-value
Sore Throat 12 Hour Mean ± SD (cm)	0.63 ± 1.05	4.45 ±2.51	< 0.001
Sore Throat 24 Hour Mean ± SD (cm)	0.80 ± 0.91	6.05 ± 2.43	< 0.001

DISCUSSION

The findings of this study suggest that the patients with oropharyngeal packing mix with 2 % Lignocaine gel developed less sore throat following surgeries and ultimately reduced perioperative morbidity.

In oronasal surgeries, oropharyngeal throat packs are frequently employed to protect the airway, allow a clear surgical field, and prevent the aspiration of fluids. Despite their benefits, the use of these packs is associated with sore throat following surgery.[11-12] The relationship between sore throat after the surgery and oropharyngeal throat packs soaked with Lignocaine gel in oronasal surgeries is examined in this discussion. Sore throat after oronasal surgeries is a well-known problem arises because of oropharyngeal irritation during endotracheal intubation, airway manipulation and the throat pack placement in the oropharynx.[13-15] The mechanical trauma, inflammation, and patient-specific factors play a key role in the etiology of sore throat following surgery.

The effectiveness of Lignocaine gel in reducing postoperative sore throat following oronasal surgeries was established by number of studies. Our study attributes a potential benefits of Lignocaine gel mix with throat pack in reducing sore throat following surgery. In group throat pack with Lignocaine (X), the incidence of sore throat was 19(31.5%) and 31(51.6%) at 12 hours and 24 hours respectively. Moreover, no cases of moderate and severe sore throat were observed in Lignocaine group. While in group throat pack without Lignocaine (Y), it was 42%(mild), 40% (moderate) and 11.6 % (severe sore throat) at 12 hours, and 10% (mild), 53.3% (moderate) and 31.6% (severe sore throat) at 24 hours. The hoarseness was observed in 11.7% and 26.7% patients with lignocaine and without lignocaine groups at 24 hours.

Our findings are in line with systemic review conducted by Tanaka Y *et al.* which established a significant decrease in severe sore throat incidence in a population treated with lignocaine either systemically or lignocaine gel impregnation as compared to control group.[8] In a different retrospective study by Agrawal M et al. found that in comparison to Dexamethasone group, mild sore throat observed in patients 31.4% at 30 min, 37.1% at 2 hours,17.1% at 6 hours, and 14.2% at 24 hours in lignocaine group. In the Lignocaine group, there was no evidence of moderate to severe sore throat. Hoarseness of voice was observed only in 4(11.4%) at 30 min in lignocaine group.[5]

Several studies have been conducted to investigate the pharmacological effectiveness of various agents in mitigating the frequency of sore throat following surgery. The frequency of sore throat following surgery was reduced by using Aspirin and Benzydamine hydrochloride gargles for 4 hour and 24 hours, according to the study by Agarwal A *et el*. The control group experienced more severe sore throat post-operatively at 0 and 2 hours. The frequency and severity of sore throat were significantly decreased in Aspirin and Benzydamine hydrochloride gargles post-operatively.[14-16] Hung NK *et al*. estimated the incidence of sore throat after surgery using various Lignocaine concentrations and Benzydamine hydrochloride. In comparison to 10% Lignocaine, 2% Lignocaine, and Normal Saline, this study revealed lower incidence of sore throat in the Benzydamine group following surgery significantly.[17] According to a study by Elgarhy *et al*. using K.Y jelly with throat packed during nasal surgeries is linked to lesser incidence of sore throat and decrease throat pain postoperatively.[18]

In this study, statistically there is less incidence of sore throat in Group-X in comparison to group Y at 12 and 24 hours subsequently. In Group-X, at 12 hours 39 patients (65%) and at 24 hours 29(48%) patients developed no sore throat, while in Group-Y, at 12 hours 4 patients (6.5%) and at 24 hours 3(5%) patients developed no sore throat respectively. The incidence of severe sore throat in group throat pack with Lignocaine (X) was 0 and while in group throat pack without Lignocaine (Y) were ranges from 11.5% to 31.5%. 11.6% patients in Group throat pack with Lignocaine (X) and 26.7% in Group throat pack without Lignocaine developed hoarseness. There were no complications noted in either group.

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LIMITATIONS OF THE STUDY

The post-operative sore throat score assessment was limited to a 24 hours period and had a small sample size.

CONCLUSION

This study demonstrated that packing a throat impregnated with Lignocaine gel 2% is a more effective way to lower the sore throat incidence post-operatively, which results from micro trauma caused by throat pack and airway instrumentation. This in turns, ultimately resulting in reduction of perioperative morbidity and length of hospital stay.

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Authors' Contribution

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

HL & A: Data acquisition, data analysis, critical review, approval of the final version to be published.

MS & MY: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

SMW & NUS: Conception, data acquisition, 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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