International Journal of Otorhinolaryngology and Head and Neck Surgery
Keerthana K et al. Int J Otorhinolaryngol Head Neck Surg. 2025 Oct;11(5):560-564
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937
DOI: https://dx.doi.org/10.18203/issn.2454-5929.ijohns20252515

Original Research Article

A prospective single blinded study on comparison of efficacy of intranasal instillation and cotton pledget packing as nasal preparatory methods for diagnostic nasal endoscopy

Keerthana K.*, Dianitta D. V., Praveen R., Raja Rajeshwari

Department of ENT, ACS Medical College and Hospital, Chennai, Tamil Nadu, India

Received: 27 July 2025
Accepted: 11 August 2025

***Correspondence:**
Dr. Keerthana K.,
E-mail: keerthanaent2022@gmail.com

ABSTRACT

Background: Nasal endoscopy requires nasal preparation with local anaesthetic-decongestant combination to reduce the discomfort experienced by the patient. An ideal delivery technique that would cause minimal discomfort to the patient but ensures a good field of vision during nasal endoscopy is essential. To compare the efficacy and safety of intranasal nasal drops instillation and cotton pledget packing as preparation methods for diagnostic nasal endoscopy.
Methods: The present study was a prospective single blinded experimental clinical study conducted at ACS Medical College and Hospital. The sample size included 48 patients who were then divided into 2 groups of 24 each. 5 ml of lignocaine-adrenaline mixture was used for nasal preparation for DNE in both Cotton Pledgets (CP) and intranasal instillation (NI) groups. Data was entered and analyzed. A p value of less than 0.05 was considered to be statistically significant.
Results: There was no significant difference in the overall pain/discomfort experienced by the patients in both the groups. The pre-endoscopic and post-endoscopic findings showed that there was no significant variation in the visualisation of the various intra nasal structures among both study groups.
Conclusions: Cotton Pledgets (CP) and intranasal nasal drops instillation (NI) preparations for endoscopy have significant merits and demerits, but in terms of discomfort and pain during procedure, nasal instillation was an effective method for preparation of patients for diagnostic nasal endoscopy. This method can be a vital resource especially during emergency situations and among patients who are anxious or sensitive to nasal packing.

Keywords: Cotton pledgets, Lignocaine, Nasal packing, Nasal endoscopy, Pain, Sprays

INTRODUCTION

Nasal endoscopy is a common diagnostic tool in day-to-day Otolaryngology practice. Nasal endoscopy allows the surgeon to visualize the posterior and superior parts of the nasal airway which cannot be seen by anterior rhinoscopy. Nasal preparation with local anaesthetic-decongestant combination is essential to reduce the discomfort experienced by the patient during nasal endoscopy. The commonly used topical anaesthetic agents are lignocaine and tetracaine. The commonly used nasal decongestants are phenylephrine, oxymetazoline, xylometazoline and adrenaline.[1-5] The choice of the desired anaesthetic decongestant preparations usually lies on the surgeons' personal preference. While preparing the nose for endoscopy the local anaesthetic agent and topical nasal decongestant can be administered either by cotton pledget packing or nasal spray or intranasal instillation.

A technique that adequately prepares the nose for endoscopy but causes only minimal discomfort would be the ideal nasal preparation method. Hence, the present study was undertaken to compare the efficacy and safety of intranasal nasal drops instillation and cotton pledget packing as preparatory methods for diagnostic nasal endoscopy.[6-10]

METHODS

This study was conducted in the outpatient department at ACS Medical College and hospital after obtaining clearance from the Institutional Ethical committee. The study was conducted among 48 patients aged 18-55 years who required DNE. Patients with comorbidities, coagulopathies and previous surgery were excluded from the study. The patients were classified into 2 groups namely, Group 1: Patients in whom 4 mm endoscope was passed easily on both nasal cavities. Group 2: Patients in whom 4 mm endoscope was passed easily only along one nasal cavity. Written consent was obtained from all the participants included in this study. In the current study the 30 ml of anesthetic-decongestant solution was prepared using 0.6ml of 1:1000 adrenaline with 29.4 ml of 4% lignocaine. 5ml of lignocaine-adrenaline mixture was used for nasal preparation for DNE in both Cotton Pledgets (CP) and intranasal instillation (NI) groups. The pre and post endoscopic observation were made by a consultant blinded to the type of anesthetic-decongestant method used. Patients in the CP group were prepared for nasal endoscopy by packing the nasal cavity with cotton pledgets soaked in the solution.

Under endoscopic guidance three nasal packs each of length of 10 cm were used for packing each nasal cavity of patients in CP group, one pack was placed along the floor, the second in middle meatus and third one medial to middle turbinate. Patients in the NI group were prepared by intra nasal instillation of 2.5 ml of the prepared anaesthetic-decongestant solution on each side of nose. The study participants were asked to wait for 10 minutes. Later the level of discomfort experienced by the study participants was assessed using the Visual Analog scale (VAS). The data sheet was prepared based on endoscopy and the responses were recorded on a scale of 0-10. The patient was assessed post procedure and the pain/discomfort experienced was documented. Differences in the visualization of structures pre and post endoscopy and complications like mucosal trauma or bleeding were also noted down. Data was entered and analyzed using Statistical Package for Social Sciences (SPSS) (version 21.0) software package. Descriptive statistics was used to define the study population. Categorical and ordinal variables were expressed as frequency/percentages. Continuous variables were expressed as mean and standard deviation. Appropriate test of significance (Chi square test and student t test) was applied the study variables to establish the relation between the study variables. A p value of less than 0.05 was considered to be statistically significant.

RESULTS

In the present study majority of the study participants were aged between 21 to 40 years with an increased male predominance. The patients in whom 4 mm endoscope was passed easily on both nasal cavities constituted 66.7% of the study participants (Table 1). The pre-endoscopic (Table 2) and post-endoscopic findings (Table 3) showed that there were no significant variations in the visualisation of the various intra nasal structures like the inferior turbinate, nasopharynx (p=0.26; p=0.14), middle turbinate (p=0.08; p=0.14), ethmoidal bulla (p=0.07; p=0.38) and uncinate process (p=0.54; p=0.33) among both study groups on both sides. Authors observed that the pain in the nose during preparation for diagnostic nasal endoscopy (p≤0.001), nasal discomfort while waiting (p≤0.001) and nasal discomfort post endoscopy (p=0.016) were significantly lower among the participants who received nasal instillation of the lignocaine-adrenaline mixture, based on Questionnaire. The patients who received the cotton pledgets reported significantly decreased trouble in swallowing (p≤0.001) and decreased throat pain before and during the procedure (p≤0.001) as compared to the group that received the nasal instillation (Table 4). Authors noted that there were no significant differences in VAS scores while assessing the nasal pain while the endoscope was passed (p=0.307), unpleasant taste (p=0.129), feeling numb (p=0.902), feeling of something stuck in the throat (p=0.142) and difficulty breathing (p=0.248) among both the groups. There were no significant differences in the overall pain/discomfort (p=0.33) among patients from both the groups (Table 4).

Table 1: Socio-demographic characteristics of the study participants (n=48).

Characteristics	Frequency (%)
Age (in years)	
≤20	3 (6.2)
21-40	37 (77.1)
41-55	8 (16.7)
Mean±SD	32.04±10.5
Sex	
Male	32 (66.7)
Female	16 (33.3)
Group distribution	
1	32 (66.7)
2	16 (33.3)

Table 2: Pre endoscopic characteristics of the study participants (n=48).

Characteristics	CP	NI	P value*
	N (%)	N (%)	
Right			
Inferior turbinate	24	24	-
Nasopharynx	3	6	0.26
Middle turbinate	16	21	0.08
Ethmoidal bulla	24	24	-
Uncinate process	7	9	0.54
Left			
Inferior turbinate	24	24	-
Nasopharynx	8	8	1
Middle turbinate	20	17	0.3
Ethmoidal bulla	3	0	0.07
Uncinate process	16	12	0.24

*p value of less than 0.05 was considered to be statistically significant.

Table 3: Post endoscopic characteristics of the study participants (n=48).

Characteristics	CP	NI	P value*
	N (%)	N (%)	
Right			
Inferior turbinate	24	24	-
Nasopharynx	22	24	0.14
Middle turbinate	24	24	-
Ethmoidal bulla	6	9	0.35
Uncinate process	19	16	0.33
Left			
Inferior turbinate	24	24	-
Nasopharynx	24	21	0.07
Middle turbinate	24	24	-
Ethmoidal bulla	12	9	0.38
Uncinate process	22	9	0.22

*p value of less than 0.05 was considered to be statistically significant.

Table 4: Visual Analog scale (VAS) scores of the study participants (n=48).

Characteristics	CP	NI	P value*
	Mean±SD	Mean±SD	
Pain in the nose during preparation for DNE	4.04±2.7	0.25±0.44	0.0001*
Nasal discomfort while waiting	2.79±1.7	0.08±0.28	0.0001*
Nasal pain while endoscope is passed	4.00±1.91	3.46±1.64	0.307
Unpleasant taste	2.54±3.05	3.63±1.58	0.129
Trouble swallowing	0.88±1.29	5.88±2.05	0.0001*
Feeling like something stuck in the throat	1.17±1.46	6.29±2.07	0.142
Difficulty breathing	0.00±0.00	0.33±0.48	0.248
Throat pain during/after the procedure	0.50±1.14	1.13±1.70	0.0001*
Nasal discomfort post endoscopy	2.17±3.00	1.42±1.44	0.016*
Tingling/Numbness in the oral cavity	1.21±1.91	1.13±2.67	0.902
Overall pain/discomfort	3.08±1.63	3.54±1.61	0.33

*p value of less than 0.05 was considered to be statistically significant.

DISCUSSION

Nasal preparation prior to diagnostic nasal endoscopy involves decongesting and anesthetizing the nasal cavities and this is a vital step for the procedure. This preparation is usually done using nasal decongestant sprays or cotton pledgets. As limited research is available regarding the effects of the various delivery methods, this study aimed

to assess the efficacy of the different modes of application of local anaesthetic and decongestant on the nasal mucosa and the discomforts experienced by the patient. A total of 48 patients were included in the study, with 24 patients in each group.

Inadequate visualisation of nasal structures during nasal endoscopy is attributed to reasons like insufficient contact time of decongestant on the nasal mucosa and in unusual situations, the size of the endoscope and the experience of the endoscope. Hence in our study, the same endoscope (4 mm) was used prior and post nasal preparation for endoscopy. The same consultant prepared the nose using the different methods and a blinded observer did the endoscopic assessment pre and post nasal preparation in both the groups. In this study, there was no significant variations in the visualisation of various structures among both the study groups. Studies conducted by Velayutham et al and Mishra et al, have also reported that no significant association existed between the visualisation of structures and the type of preparatory methods.[12,13]

This study showed that the nasal discomfort due to nasal preparation was significantly lower among the participants who received nasal instillation of the lignocaine-adrenaline mixture. Similar to our study, Velayutham et al, reported increased nasal discomfort in the cotton pledget group as compared to the nasal instillation group.[12] Maffei et al, in their study among caucasian population reported that the packing method was more time consuming and more painful as compared to the nasal sprays.[16] Studies have reported that lignocaine acted as an irritant and the trickling into the oropharynx lead to sore throat and heaviness.[17,18] However we encountered no such symptoms in our study. Mishra et al, had reported that the patients who received 10% lignocaine as nasal spray had experienced increased pain when compared to lignocaine-soaked cotton pledget.[7,13] This can be attributed to the fact that 10% lignocaine spray, could cause more irritation but only 4% lignocaine was used in our study.

In the present study we observed that the patients who received nasal packing experienced increased discomfort while waiting and post-procedure. Studies conducted by Hu et al and Sresstha et al, have reported similar observations.[11,13] This might be explained by the anxiety associated with introduction of instruments into the nasal cavity and the pressure the cotton pledget exerts on the nasal mucosa. Topical anaesthetics have an unpleasant taste however they reduce the level of discomfort experienced by the patients during diagnostic nasal endoscopy.[14] Nath et al, have reported rare cases on lignocaine toxicity among patients who underwent nasal packing as compared to patients who received nasal sprays, however no such incidents were observed in our study.[19] Khatri et al, have reported that the combined effects of the anaesthetic and decongestant agents aid in better visualization of the sinonasal cavity during diagnostic nasal endoscopy.[20] Studies have reported that among the patients undergoing diagnostic nasal endoscopy, a combination of a vasoconstrictor and local anaesthetic is essential for better visualization of nasal structure and for less painful instrumentation especially among anxious patients with decreased pain thresholds. These methods are also useful in patients with smaller nasal cavities. The agents are usually delivered using CP and intranasal instillation (NI). This study showed no significant differences in the visualization of structures in both the preparation groups. Hence both techniques can be interchangeably used depending on the indication for endoscopy and the tolerance of the patient.[14,21-22]

Bony anatomical variations cannot be altered by decongestants used in either form which could affect the results. The possibility of unpleasant experiences due to prior procedures, could have an effect on follow up endoscopic procedures which can affect the results. Long-term studies with multiple agents and delivery systems are required to better understand their role in improving patient comfort.

CONCLUSION

The intranasal nasal drops instillation method for pre-endoscopic preparation showed decreased pain sensation in the nose and decreased nasal discomfort while waiting for endoscopy post preparation of nose and post endoscopy procedure. In contrast, the cotton pledget method showed throat pain and throat discomfort while swallowing post nasal preparation. However, the pre and post endoscopic findings did not show any significant variations in both the preparation methods. Since both the methods have pros and cons, both the method can be used interchangeably depending on the emergency of the situation and the patient tolerance status.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Şahin Mİ, Kökoğlu K, Güleç Ş, Ketenci İ, Ünlü Y. Premedication Methods in Nasal Endoscopy: A Prospective, Randomized, Double-Blind Study. Clin Exp Otorhinolaryngol. 2017;10(2):158-63.
2. Tichenor WS, Adinoff A, Smart B, Hamilos DL: Nasal and sinus endoscopy for medical management of resistant rhinosinusitis, including postsurgical patients. J Allergy Clin Immunol. 2008;121:917-27.
3. Govindaraj S, Adappa ND, Kennedy DW: Endoscopic sinus surgery: evolution and technical innovations. J Laryngol Otol. 2010;124:242-50.
4. Chandra RK, Conley DB, Kern RC: Evolution of the endoscope and endoscopic sinus surgery. Otolaryngol Clin North Am. 2009;42:747-52.

5. Midwinter KI, Ahmed A, Willatt D. A randomised trial of flexible versus rigid nasendoscopy in outpatient sinonasal examination. Clin Otolaryngol Allied Sci. 2001;26(4):281-3.
6. Pownell PH, Minoli JJ, Rohrich RJ. Diagnostic nasal endoscopy. Plast Reconstr Surg. 1997;99(5):1451-8.
7. Mishra P, Kaushik M, Dehadaray A, Qadri H, Raichurkar A, Seth T. Preparation of nose for nasal endoscopy: cotton pledget packing versus topical spray. A prospective randomized blinded study. Eur Arch Otorhinolaryngol. 2013;270(1):117-21.
8. Higgins TS, Hwang PH, Kingdom TT, Orlandi RR, Stammberger H, Han JK. Systematic review of topical vasoconstrictors in endoscopic sinus surgery. Laryngoscope. 2011;121(2):422-32.
9. Sarmento Junior KM, Tomita S, Kós AO. Topical use of adrenaline in different concentrations for endoscopic sinus surgery. Braz J Otorhinolaryngol. 2009;75(2):280-9.
10. Smith JC, Rockley TJ. A comparison of cocaine and 'co-phenylcaine' local anaes thesia in flexible nasendoscopy. Clin Otolaryngol. 2002;27:192–6.
11. Hu CT. Gauze pledgetting versus endoscopic-guided aerosolized spray for nasal anesthesia before transnasal EGD: a prospective, randomized study. Gastrointest Endosc. 2010;71(1):11-20.
12. Velayutham P, Davis P, Ravichandran S, John J. A Prospective, Randomized, Double-Blind Study on the Efficacy of Different Modes of Topical Application of Nasal Anesthetics in the Diagnostic Nasal Endoscopy Procedure. Cureus. 2022;14(9):29436.
13. Shrestha KK, Dhungana A, Rijal AS, Joshi RR. Nasal preparation prior to nasal endoscopy: a comparison of cotton pledget packing versus topical spray. Nepal Med College J. 2023;25(4):358-63.
14. Hwang SH, Park C, Kim BG, Cho JH, Kang JM. Topical anesthetic preparations for rigid and flexible endoscopy: a meta-analysis. Eur Arch Otorhinolaryngol. 2014;272:263-70.
15. Lee YC, Wang CP: Cotton pledget method for nasal decongestive anesthesia prior to transnasal endoscopy. Am J Gastroenterol. 2008;103:3212-3.
16. Maffei M, Dumonceau JM. Endoscopic-guided versus cotton-tipped applicator methods of nasal anesthesia for transnasal esophagogastroduodenoscopy. Am J Gastroenterol. 2008;103:3209.
17. Thanaviratananich S, Jeungchotipat P, Suetrong S, Thanaviratananich S. The efficacy of 4% lidocaine with 3% ephedrine used on nasal packs or as a nasal spray for pain relief in nasal endoscopy. Asian Biomed. 2011;5:849–53.
18. Sharma RK, Paulose KO, Al-Khalifa S, Shenoy P. Pre-operative nasal preparation- nasal packing and spraying compared. J Laryngol Otol. 1992;106:39–41.
19. Nath MP, Baruah R, Choudhury D, Chakrabarty A: Lignocaine toxicity after anterior nasal packing. Indian J Anaesth. 2011;55:427.
20. Khatri H, Bradshaw K, Kelly S. A randomised placebo-controlled trial of topicalization for flexible nasal endoscopy. Australian J Otolaryngol. 2023;8:6.
21. Saif AM, Farboud A, Delfosse E, Pope L, Adke M. Assessing the safety and efficacy of drugs used in preparing the nose for diagnostic and therapeutic procedures: a systematic review. Clin Otolaryngol. 2016;41(5):546-63.
22. Gun R, Yorgancılar E, Yıldırım M, Bakır S, Topcu I, Akkus Z. Effects of lidocaine and adrenaline combination on postoperative edema and ecchymosis in rhinoplasty. Int J Oral Maxillofac Surg. 2011;40(7):722-9.

Cite this article as: Keerthana K, Dianitta DV, Praveen R, Rajeshwari R A prospective single blinded study on comparison of efficacy of intranasal instillation and cotton pledget packing as nasal preparatory methods for diagnostic nasal endoscopy. Int J Otorhinolaryngol Head Neck Surg 2025;11:560-4.