Lignocaine with Adrenaline Nasal Packing in the Management of Acute Inflammation of Paranasal Sinuses

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ABSTRACT

BACKGROUND

Sinusitis is caused because of the inflammation of nasal mucosa and the para nasal sinuses which lasts at least for 12 weeks. In this study we are introducing a decongestant with the addition of topical anaesthetic, directly into the middle meatus, base, nasal septum and sphenoethmoidal recess under direct endoscopic visualization. This almost always results in an improvement of the symptoms by promoting the drainage of secretions.

METHODS

We enrolled 100 patients of acute and acute exacerbations of chronic sinusitis to study the effect of (a mixture of 27 mL of 4 % lignocaine and 3 ampoules of 1: 1000 adrenaline) nasal packing in reducing the congestion around the paranasal sinus's ostium and improvement of symptoms in the study population by comparing the symptom score and endoscopic appearance before and after the endoscopic procedure.

RESULTS

The mean difference in symptom score for pre-treatment was found to be 27.46 and post treatment was found to be 18.35. It shows significant improvement in endoscopic change in nasal endoscopy done after the conservative procedure.

CONCLUSIONS

Adrenaline nasal packing reduces the congestion of the sinus ostium and facilitates the drainage of sinuses through natural ostium without any surgical procedure. It results in symptomatic improvement and through endoscopy we can visualize the discharge draining freely from the sinuses. It is useful in patients who have contraindications for surgical procedures.

KEYWORDS

Acute Sinusitis, Diagnostic Nasal Endoscopy, Packing

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BACKGROUND

Sinusitis is an acute inflammatory process involving one or more of the paranasal sinuses. Maxillary and ethmoid sinuses are most commonly involved. Sinusitis has been found to be increasing in both incidence and prevalence[1]. Several articles have been published regarding the etiopathogenesis, microbiology, anatomical variations and management of acute sinusitis. Clinically, sinusitis causes fluid accumulation within the cavity, or the underlying bone due to an inflammatory response of the mucous membrane of nasal cavity and the paranasal sinuses[2]. It is also defined as a group of disorder characterised by the inflammation of mucosa of the nose and the para nasal sinuses lasting for at-least 12 weeks[2]. Diagnostic nasal endoscopy is done for the evaluation of nose and the paranasal sinuses as a routine procedure in patients with an evidence of suspected disease of the nose and para nasal sinuses. Endoscopic diagnosis of acute sinusitis has proven to be beneficial in the conservative medical therapy[3]. It is useful to pinpoint the aetiological focus. Even in empyema or in cases with fluid level in the sinus, it is frequently possible to introduce a decongestant, perhaps with the addition of topical anaesthetic, directly into the middle meatus, under direct endoscopic visualisation. This almost always results in an improvement of the symptoms by promoting the drainage of secretions. With adjuvant antibiotic therapy, most cases of acute sinusitis can be managed conservatively.

The objective is to study the effect of (a mixture of 27 mL of 4 % lignocaine and 3 ampoules of 1: 1000 adrenaline) nasal packing in reducing the congestion around the paranasal sinuses ostium and the improvement of symptoms in the study population by comparing the symptom score and endoscopic appearance before and after the endoscopic procedure.

METHODS

This prospective study included patients attending ENT Outpatient Department in Meenakshi Medical College Hospital & Research Institute. The sample size is 100 patients. All eligible patients based on inclusion and exclusion criteria, who attended the outpatient department of ENT during the study period from February 2018 to September 2019 were included as study participants in this study. An informed consent was taken from all the patient included in the study.

Inclusion Criteria

- Age: 10 - 70 Years.
- Patients with acute exacerbation of chronic sinusitis willing for study.
- Patients with acute sinusitis willing for study.

Exclusion Criteria

- Patients not giving written informed consent.
- Patients with previous sinus surgery.
- Patients with other nasal pathology.
- Patients with any other co-existing systemic diseases.
- Patients with acute sinusitis with complications.
- Pregnant women.

All patients satisfying the criteria of selection were subjected to:

1) History

Sl. No.	Symptoms	0	1	2	3	4	5
1.	Need to blow nose						
2.	Sneezing						
3.	Runny nose						
4.	Cough						
5.	Post-nasal discharge						
6.	Thick nasal discharge						
7.	Ear fullness						
8.	Dizziness						
9.	Ear pain						
10.	Facial pain / pressure						
11.	Difficulty falling asleep						
12.	Wake up at night						
13.	Lack of a good night's sleep						
14.	Wake up tired						
15.	Fatigue						
16.	Reduced productivity						
17.	Reduced concentration						
18.	Frustrated / restless / irritable						
19.	Sad						
20.	Embarrassed						

Table 1. Detailed History has been Taken with Regards with the Symptoms of Rhinosinusitis with the Help of Table 1. SNOT 20

0. No problem.
1. Very mild problem.
2. Mild or slight problem.
3. Moderate problem.
4. Severe problem.
5. Problem as bad as it can be.

Clinical examination, rhinoscopy examination, otological examination, throat and neck examination. All cases with clinical features of acute rhinosinusitis as per SNOT (Sino-Nasal Outcome Test) 20 are subjected to DNE (Diagnostic Nasal Endoscopic) and findings scored with Lund and McKay staging system: endoscopic appearance before the procedure the Snot 20 and DNE findings have been recorded.

Diagnostic Nasal Endoscopy

The nasal endoscope used for diagnostic nasal endoscopic examination was 4 mm Hopkins rod endoscopes with 0º and 30º angulation. With these endoscopes, first, second, and third pass evaluation of nasal cavity and in turn about the paranasal sinuses by diagnostic nasal endoscopic evaluation done.

Position of the Endoscopist and the Patient

The endoscopist sits or stands on the patient's right. The patient is in the supine position with the head facing the examiner. When only the endoscope is being used, both

hands are used to guide the scope. If a second instrument is required, the endoscope is held between the thumb and the forefinger of the left hand, which rests lightly on the cheek and the bridge of the nose of the patient. All diagnostic nasal endoscopy should be preferably performed with a 30 degree wide angled nasal endoscope. This endoscope has enough direct forward vision to permit introduction in the direction of the main axis and thus avoid injury to the mucus membranes. It also has a good viewing angle, enabling visualisation of the middle meatus and also has a panoramic view of the nasopharynx. To prevent fogging, the tip of the endoscope can be dipped in a solution of a Savlon.

DNE is Performed in Three Passes

In the first pass, the endoscope is passed along the floor of the nose inspecting the inferior turbinate, nasal septum and the middle turbinate. Once the choana is reached, the eustachian tube orifice, fossa of Rosen muller and the nasopharynx are visualised. The scope is rotated to visualise the entire nasopharynx and the opening of the opposite eustachian tube. As the scope is withdrawn it is insinuated under the inferior turbinate to examine the inferior meatus. In some cases, the nasolacrimal duct opening can be visualised as either a small punctate or a slit like opening (Hasner's valve) at the junction of the anterior and middle thirds of the inferior turbinate. The freer elevator can be used to medialise the inferior turbinate. Slight pressure on the medial canthus area can lead to the appearance of an air bubble at the duct opening.

The second pass is made along the middle meatus. The insertion of uncinate process can be identified by a shallow groove when the scope is introduced into the middle meatus and so the inferior aspect of the middle turbinate is followed posteriorly. The free edge of the uncinate may be visualised just above the inferior turbinate. Still more posteriorly, the posterior fontanelle and accessory maxillary ostium can be seen.

The third pass, the scope is directed posteriorly between the middle turbinate and the septum into the sphenoethmoidal recess. High up on the anterior wall of the sphenoid sinus at about the level of the superior turbinate or slightly inferiorly the sphenoid ostium can be visualised.

The DNE findings are carefully entered separately for the left and right side on the basis of with Lund and Mackay staging system: Endoscopic appearance score.

Preparation

- After recording the pre procedure vital signs and DNE findings, procedure is carried on by nasal packing.
- In our study, a mixture of 27 mL of 4 % lignocaine and 3 ampoules of 1: 1000 adrenaline was used.
- The resulting concentration is 4 % lignocaine and 1: 10000 adrenaline. The cottonoids or ribbon gauze strips are dipped in the above solution and then squeezed well before being introduced into the nasal cavity.
- The cottonoids or ribbon gauze strips are to be applied to the nasal septum, the base and the free edge of the middle turbinate, the middle meatus, the floor of the nose and the sphenoethmoidal recess.
- We will wait for 15 minutes, and then pack removal is done.

The DNE findings immediately after procedure are carefully recorded separately for the left and right side on the basis of Lund and Mckay staging system: Endoscopic appearance score.

Characteristic Right Left

Polyp (0, 1, 2, 3)
Oedema (0, 1, 2, 3)
Discharge (0, 1, 2, 3)

Polyps

0, absence of polyps; 1, polyps in middle meatus only; 2, polyps beyond the middle meatus, but not completely obstructing the nose; 3, polyps completely obstructing the nose.

Oedema

0, absent; 1, mild; 2, severe.

Discharge

0, no discharge

The duration of post treatment scoring is about 15 minutes. We have taken cases of sinusitis without polyposis for the study, so the scoring for discharge and oedema was only done

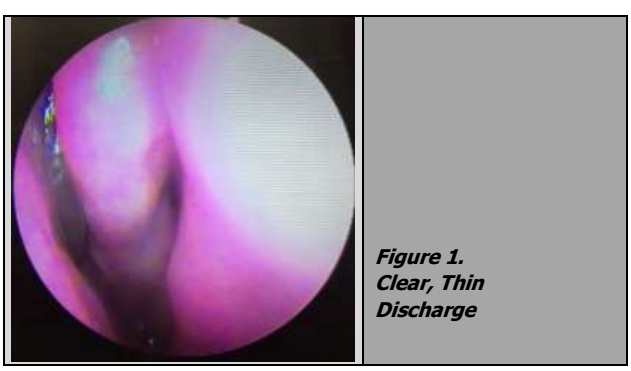

Figure 1. Clear, Thin Discharge

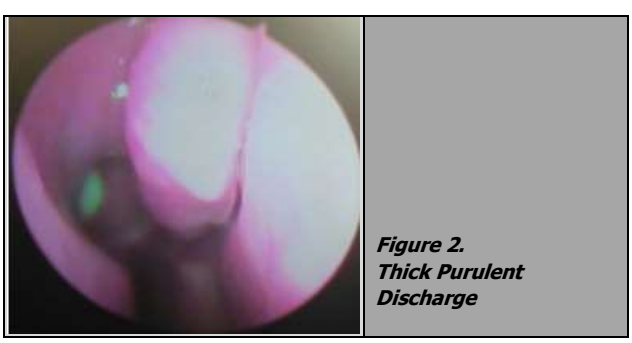

Figure 2. Thick Purulent Discharge

Statistical analysis is done by Wilcoxon sign rank test.

RESULTS

In this study, among acute sinusitis patients attending ENT Outpatient Department in Meenakshi Medical College Hospital & Research Institute, maximum of 28 % of the study participants belonged to 41 - 50 years of age.

Age Group	Percentage
< 20 years	12
21 - 30 years	17
31 - 40 years	18
41 - 50 years	28
51 - 60 years	22
> 60 years	03
Total	**100**

Table 2. Age Wise Distribution of Study Participants

Questions of SNOT 20	Pre Treatment		Post Treatment	
	Percentage of Cases with No to Mild Problem (Scores 0 - 2)	Percentage of Cases with Moderate to Bad Problem (Scores 3 - 5)	Percentage of Cases with No to Mild Problem (Scores 0 - 2)	Percentage of Cases with Moderate to Bad Problem (Scores 3 - 5)
Need to blow nose	61	39	82	18
Sneezing	57	43	76	24
Runny nose	40	60	67	33
Post nasal discharge	70	30	60	18
Thick nasal discharge	81	19	93	07
Ear fullness	69	31	86	14
Ear pain	84	16	88	12
Cough	86	14	90	10
Facial pain / Pressure	34	66	87	23
Difficulty in falling asleep	72	28	88	12
Wake up at night	54	46	71	29
Lack of good night's sleep	81	19	93	07
Wake up tired	75	25	88	12
Dizziness	68	32	87	13
Fatigue	77	23	90	10
Reduced productivity	94	06	95	05
Reduced concentration	88	12	93	07
Frustrated	77	23	88	12
Sad	81	19	87	13
Embarrassed	72	28	84	16

Table 3. Pre- and Post-Treatment SNOT Score of the Study Participants

Questions of SNOT 20	Pre Treatment (%)	Post Treatment (%)	Percentage of Improvement
Need to blow nose	37	13	50.1
Sneezing	44	22	45.3
Runny nose	68	33	53.7
Post nasal discharge	28	18	34.6
Thick nasal discharge	19	09	55.7
Ear fullness	33	14	59.5
Ear pain	18	12	35.4
Cough	16	10	40.1
Facial pain / Pressure	68	23	67.2
Difficulty in falling asleep	28	12	59.4
Wake up at night	46	29	37.9
Lack of good night's sleep	21	07	70.1
Wake up tired	27	14	50.1
Dizziness	34	15	57.7
Fatigue	23	10	59.2
Reduced productivity	08	05	43.1
Reduced concentration	12	07	45.6
Frustrated	25	12	54.3
Sad	19	11	33.4
Embarrassed	28	16	44.5

Table 4. Percentage of Improvement in Each Symptom after Treatment

SNOT 20 score	Frequency (N)	Mean	SD	P Value
Pre treatment	100	27.46	9.4	< 0.001*
Post treatment	100	18.35	7.85	

Table 5. Mean SNOT Score among Study Participants

Wilcoxon sign rank test shows statistically highly significant p value < 0.001*

Among 100 participants presented, 56 % of them were females and 44 % of them were males in this study. Among the study participants percentage of improvement in symptoms after treatment is shown in Table 4.

Mild oedema was found among 43 % of the participants pre-treatment, severe oedema was found among 30 % of the participants pre-treatment in this study while mild oedema was found in 41 % of the study participants post treatment and 14 % of the participants had severe oedema. The difference between pre- and post-treatment for oedema was found to be statistically significant with p value of 0.0056. *Significant; Chi square value: 10.4

Mild discharge was noted among 36 % and 48 % of the participant's pre and post treatment whereas severe discharge was noted among 5 % and 33 % of the patient's pre and post treatment respectively. Before treatment 59 % of the participants had no discharge and in post treatment 19 % of the participants had no discharge. The difference was found to be statistically highly significant with p value of < 0.001*Significant; Chi square value: 42.85.

DISCUSSION

Sinusitis has a self-reported incidence of 135 per 1,000 of the population per year and was the principle reason for almost 12 million physician office visits during 1995 36 – 39. Sinusitis significantly impacts quality of life measures. Stammberger[4] and Stammberger et al[5] proposed that ostiomeatal complex stenosis may be resulting from either the anatomical configuration or due to hypertrophied mucosa, can cause obstruction and stagnation of secretions that may become infected. According to Mackay and Lund[6] the ostiomeatal complex acts a drainage pathway for maxillary, anterior ethmoids and frontal sinuses.[6] Posterior ostiomeatal unit was considered as part of the sphenoid sinus. In most areas of the ostiomeatal complex overcrowding occurs due to an anatomical variation, two mucosal layers which comes in contact with each other, thus increasing the possibility of local impairment of mucociliary clearance. Secretions are usually retained at the site of impairment thus creating the potential for infection even without ostial closure. Anatomically, the most likely areas which can have this type of mucosal contact are in the narrow mucosa lined channels present in the middle meatus and the ethmoidal infundibulum. Sinusitis is more common condition which can be one of the main reasons for which an antibiotic is prescribed and for lost productivity in the workforce.[7] Medical treatment may be antimicrobial or anti-inflammatory, with an aim of reducing the infective and inflammatory load to both reduce the severity and duration of illness, to prevent recurrence and complications, or reducing symptom severity alone. Vasoconstrictors added to local anaesthetic solutions provide several advantages to the

anaesthetic.[8] First, the addition of vasoconstrictor has been shown to increase the duration of anaesthetic effect. Second, the vasoconstrictor can provide a margin of safety in the use of the local anaesthetic by decreasing the systemic toxicity of local anaesthetics.[9] This is accomplished by retarding their absorption into the systemic circulation. Finally, the addition of vasoconstrictor can enhance the quality of the neural blockade.

The present work was undertaken in the Department of Otorhinolaryngology & Head and Neck Surgery, Meenakshi Medical College Hospital & Research Institute Kanchipuram, Tamilnadu to study the effect of (a mixture of 27 mL of 4 % lignocaine and 3 ampoules of 1: 1000 adrenaline) nasal packing in reducing the congestion around the paranasal sinuses ostium and facilitates the drainage of sinuses through natural ostium showing significant symptomatic improvement.

CONCLUSIONS

This study was conducted among 100 patients with acute sinusitis or acute exacerbation of chronic sinusitis who are above 10 years and below 70 years. For these patients, diagnostic nasal endoscopy was done using a mixture of 27 mL of 4 % lignocaine and 3 ampoules of 1:1000 adrenaline. Pre- and post-procedure scores were compared.

From this study we came to a conclusion that adrenaline nasal packing reduces the congestion of the ostium and facilitates the drainage of sinuses through natural ostium without any surgical procedures. It results in symptomatic improvement and through endoscopy we can visualize the discharge draining from the sinuses. It is of useful in patients who have contraindications for surgical procedures.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.
Financial or other competing interests: None.
Disclosure forms provided by the authors are available with the full text of this article at jebmh.com.

REFERENCES

[1] Philpott C. Rhinosinusitis: definitions, classification and diagnosis. In: Scott - Brown's Otolaryngology, head and neck surgery. Vol. 1. 8th edn. Florida, FL: CRC Press 2018: p. 1025-1046.
[2] Stammberger H. Functional endoscopic sinus surgery: the Messer Klinger technique. Philadelphia, PA: BC Decker Publication 1991.
[3] Stammberger HR, Bolger WE, Clement PAR, et al. Anatomic terminology and nomenclature in sinusitis. Ann Otol Rhinol Laryngol 1995;104(Suppl 167):7-19.
[4] Stammberger H, Wolf G. Headaches and sinus disease: the endoscopic approach. Ann Otol Rhino Laryngol 1988;(Suppl 134):3-23.
[5] Stammberger H. Secretion transport. In: Functional endoscopic sinus surgery. Philadelphia: BC Decker 1991: p. 17-46.
[6] Lund VJ, Mackay IS. Staging in rhinosinusitis. Rhinology 1993;31(4):183-184.
[7] Report of the Rhinosinusitis Task Force Committee Meeting. Alexandria, Virginia, August 17, 1996. Otolaryngology and Head and Neck Surgery 1997;117(3 Pt 2):S1-S68.
[8] Mishra P, Kaushik M, Dehadaray A, et al. Preparation of nose for nasal endoscopy: cotton pledget packing versus topical spray. A prospective randomized blinded study. Eur Arch Otorhinolaryngol 2013;270(1):117-121.
[9] Al-Qudah M. Efficacy of lidocaine with or without epinephrine in rigid nasal endoscopy. Am J Rhinol Allergy 2014;28(6):520-522.