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ORIGINAL RESEARCH PAPER

REFERRED PAIN OF SINONASAL ORIGIN : CLINICAL PROFILE & MANAGEMENT

KEY WORDS: Rhinogenic headaches, Septoplasty ,Chronic rhinosinusitis, F.E.S.S, Nasal endoscopy

Otorhinolaryngology

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ABSTRACT	 INTRODUCTION: Rhinogenic headaches are basically described as headache or facial pain caused by rhinological source. The presence of nasal symptoms & it's temporal relationship with headache is the key factor that can guide the diagnosis and patient management. AIMS: This study aims to evaluate the clinical profile of patients with headache of sinonasal origin and it's management. MATERIALS & METHODS: It was a Prospective study conducted in M.G.M Medical College & associated M.Y group of hospitals from March 2019 to March 2020. 64 patients of age group 18 years to 60 years having chronic rhinosinusitis with headache were included in the study and there clinical profile was assessed in details and were then managed surgically. RESULTS: A total of 64 patients were included in the study,34 male & 30 female with the mean age group of 31.4 & 30.1 years respectively. Out of 64 patients,67% were completely free from headache,15% were significantly improved,7% had mild relief & 11% did not show any benefit in headache from surgery. Postoperatively, there was statistically significant difference was found patient's symptomatology (i.e p value =0.0165). CONCLUSION: To make the diagnosis both anatomical & infective factors needed to be considered.Correction of obvious anatomic abmormalities can significantly improve several important clinical outcomes. 			

INTRODUCTION

Nasal and sinus complaints are among the most common reasons for visits to primary health care physicians, otolaryngologists, and allergists. Very often, a patient with headache and facial pain presents with a diagnostic challenge.(1) Rhinitis, rhinosinusitis and migraines affect common locations & have overlapping symptoms (nasal congestion, rhinorrhea, facial pressure-fullness, headache) and precipitating triggers (weather changes, inhaled irritants, allergies) creating diagnostic challenges.(2)

Rhinogenic headaches are basically described as headache or facial pain caused by rhinological source. This definition excludes neurological, neuromuscular and vascular type of headaches, including tension headaches, migraine headaches and cluster headaches.(3)

Sluder in 1908 described a syndrome of recurrent hemifacial pain with concomitant parasympathetic symptoms i.e unilateral rhinorrhea and congestion. This type of headache was later associated with contact point headache.(3)

In 1948 Wolff (6) demonstrated that stimulation of various areas in the sinuses produced facial pain and headache. The conditions causing rhinogenic headaches are also described by International Headache Society (IHS) and the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS).(4)

Evidently, when ventilation of the sinus outflow tract is inadequate or completely obstructed, there occurs marked increase in pressure within the sinuses causing mucosal inflammatory changes and pain. The characteristics of facial pain, it's location, severity, frequency and duration is important. The presence of nasal symptoms and it's temporal relationship with headache is the key factor that can guide the diagnosis and patient management. (3)

Pain and tenderness in the frontal region is often a symptom of frontal sinusitis(5), pain and tenderness relating to the either side on maxilla may be symptom of maxillary sinusitis(6), pain between the eyes can indicate ethmoiditis and headache referred to vertex could be suggestive of sphenoid sinusitis.

In past many decades, numerous studies have documented about the overall subjective improvement of headaches and facial pain following surgeries that are either directed at various contact points between 2 opposing mucosal surfaces within the nasal cavities, most commonly observed between an osseous spur along a deviated nasal septum and the adjacent middle or inferior nasal turbinate, or between a large concha bullosa and the lateral nasal wall.(7) Patients with refractory headaches are often very likely to have signs of underlying sinonasal inflammatory change or they can demonstrate contact points on CT or endoscopy, and thus benefit from the nasal surgery directed to the underlying inciting pathology.(8)

The present study aims to assess the clinical and relevant pathological profile of the patients with headache in chronic nasal obstruction and chronic Rhinosinusitis subjects.

METHODOLOGY

It was a Prospective study conducted in M.G.M Medical College & associated M.Y group of hospitals from March 2019 to March 2020. 64 patients of age group 18 years to 60 years having chronic rhinosinusitis with headache not responding to conservative management were included in the study. Patients having headache due to causes other than sinusitis were excluded from the study.

Detailed history of all the presenting symptoms like nasal discharge (whether watery, mucoid or purulent), nasal obstruction (onset, duration, frequency) recurrent sneezing, postnasal discharge or any associated aural or allergic pathology was taken. Thorough ENT examination was conducted with more emphasis on anterior and posterior rhinoscopy. On *Anterior rhinoscopy*, septal deviation, caudal dislocation, nasal cavity patency, condition of nasal mucosa, status of middle and inferior turbinate (hypertrophy, atrophy, curvature), nasal discharge (watery, mucoid, purulence) and presence or absence of any nasal mass was noted. On *Posterior rhinoscopy*, character of post nasal discharge, posterior ends of turbinate, presence of any polypoidal mass and nasopharangeal end of eustachian tube was assessed.

DNE was done in all subjects using 0° and 30° endoscopes. To achieve local anesthesia and decongestion, prior nasal

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packing was done with 4% lignocaine and xylometazoline solution. The patients underwent computed tomography scan of paranasal sinuses and coronal and axial sections (when required) were obtained. CT, due to its exquisite ability to display and differentiate hypertrophic mucosa, bone, and air, is the current imaging standard for the evaluation of sinonasal anatomy. (9)

The diagnosis was made by using International Classification of Headache Disorders (ICHD 3)(10) as follows Clinical, nasal endoscopic and/or imaging evidence of current or past infection or other inflammatory process within the paranasal sinuses. Evidence of causation demonstrated by at least two of the following:

- headache has developed in temporal relation to the onset of chronic rhinosinusitis
- headache waxes and wanes in parallel with the degree of sinus congestion and other symptoms of the chronic rhinosinusitis
- headache is exacerbated by pressure applied over the paranasal sinuses
- in the case of a unilateral rhinosinusitis, headache is localized and ipsilateral to it
- Not better accounted for by another ICHD-3 diagnosis.

Patients diagnosed with headache associated with chronic rhinosinusitis refractory to medical treatment and with supportive diagnostic nasal endoscopy and radiological findings were selected for undergoing septoplasty with FESS.

RESULTS

A total of 64 patients were included in the study,34 male & 30 female. The majority (29) of patients were belonging to 21 to 30 age group. Followed (15) by 31 to 40 age group. Age groups 18-20 & 41-50 had comparable (9,8 respectively) incidences, while least commonly involved was 51-60 group showing only 3 cases. In the study we found male pre ponderance, as 34 male and 30 female were included, male to female ratio being 1.14:1. The study included 64 patients having both chronic nasal obstruction and headache along with other variable symptoms. In other symptoms, most frequent was nasal discharge found in 42 patients followed by recurrent sneezing (24) and post nasal drip (23). The pain due to sinonasal pathology was found to be radiating primarily to four sites, frontal being the most common (69%). 14 % patients had retroorbital & 14% patients had diffused type of headache. Only 3% patients complained of medial canthal pain.

Anterior rhinoscopy was done in all the subjects in which nasal mucosa was found normal in majority (51%) of patients but hyperemic in 17% and pale in 31% signifying chronic nature of disease. Nasal septum deviation was the most common (87%) finding, that also lead to compensatory inferior turbinate hypertrophy in majority (70%) of patients. Followed by middle turbinate hypertrophy in 43(67%) patients and spur in 35 (55%), nasal polyp in 12(19%) patients respectively.

Diagnostic nasal endoscopy showed DNS in 59 patients,37 U/L & 22 B/L, ITH in 53,29 U/L & 24 B/L, MTH in 47 & spur in 40 patients 32 U/L & 14 B/L. Pus in the middle meatus was found in 21 patients 14 U/L & 7 B/L.CT PNS Coronal section Mucosal contact point in 41 patients U/L & 3 patients B/L Concha bullosa was found in 28, U/L & 11,B/L. Paradoxical MT was seen in 23 U/L & 3 B/L. Enlarged bulla in 16 cases, only one being B/L. While uncinate was found enlarged in 9 patients only. CT PNS Coronal view showed mucosal abnormality, most commonly involved sinus was maxillary sinus in 38 patients followed by anterior ethmoid in 28, posterior ethmoid in 18.Least commonly involved was frontal & sphenoid sinuses.

Out of 60 patients, 67% were completely free from headache, 15% were significantly improved, 7% had mild

relief & 11% did not show any benefit in headache from surgery. Overall, 54 patients were relieved in nasal obstruction leaving 10 with residual symptom, out of 42 patients,13 continued to have nasal discharge,10 headache,5 post nasal drip & 3 aural fullness. Recurrent sneezing was least relieved by the operative intervention, showing allergic nature of its etiology. Postoperatively, there was statistically significant difference was found. (i.e p value =0.0165).



Figure 1.(a) showing pus in the middle meatus (b) showing maxillary antrostomy (c) showing left sided spur touching inferior turbinate(d) showing endoscopic view of spurectomy.



Figure 2. showing concha bullosa and IT hypertrophy (left) & diffused mucosal abnormality (right).

Table 1 : Main symptoms during preoperative evaluation

Table 1					
Symptom	No. of cases	Percentage			
Nasal obstruction	64	100			
Nasal discharge	42	65			
Headache	64	100			
Post nasal drip	23	36			
Recurrent sneezing	24	37			
Aural fullness	14	22			

Table 2 : Localization of Headache

Localization	Frequency	Percentage
Frontal	44	69
Retro orbital	9	14
Medial canthal	2	3
Diffused	9	14

DISCUSSION

In the cases of facial pain and headache attributed to contact points, secondary to rhinosinusitis, patients invariably have coexisting symptoms of nasal obstruction, rhinorrhea and alteration of smell.(11)

Many anatomic variations of the structures in the middle meatus can narrow the stenotic clefts even more and thus predispose to more or less intense contact of opposing mucosal surfaces.

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Age-Sex Distribution

In our study, out of 64 patients, 34(53%) was male & 30(47%) were female with M:F ratio being 1.13:1 and majority (46%) belonged to 21-30year age group. In a similar study, Sangeeta Aggarwal et.al (12) had a total of 50 patients, in which 35 were male & 15 were female with mean age of 28.96 years.

Pre-operative Symptoms

Verma et. Al. (13) in their study of 100 patients found that in patients of nasal obstruction, nasal discharge was the predominant symptom (80%) followed by headache(60%) sneezing (30%),post nasal drip (20%).In our study we observed nasal discharge in 65% patients, post nasal drip in 36%, recurrent sneezing in 37% & aural fullness was least common (22%).

Localization of headache

In present study we noted medial canthal and retro orbital pain in 17% patients followed by diffused (17%). In another study done by Rai UL et al. (2018)(14) noted highest in frontal region headache in 82% followed by periorbital (34%) & diffused (4%). Laxamanan et. al(15) reported maximum (48%) in frontal region & periorbital in 14% patients.

Anterior rhinoscopy & Nasal endoscopy findings

In the study, the findings on anterior rhinoscopy & diagnostic nasal endoscopy were found to be similar for most of the parameters. Although some findings like posteriorly lying nasal septal deviation and septal spur were better visualized in DNE. In present study the predominant sign was deviated nasal septum (92%) followed by inferior turbinate hypertrophy (83%). In another similar study by Maurya et. al, IT hypertrophy was seen in 83% while DNS in 69% & mucosal congestion in 21%, we noted it in 17% cases. Concha bullosa was the most prevalent (61%) variation of middle turbinate in our study, followed by paradoxical middle turbinate (40%), enlarged bulla (25%), medially bent uncinate (17%), enlarged uncinate in 14% cases.

Mucosal changes in CT Paranasal Sinus

Maxillary sinus was the most commonly involved sinus (59%), followed by anterior ethmoid (43%), posterior ethmoid (28%), frontal & sphenoid were the least commonly found to be involved 4% & 1% respectively. Verma et. al also reported involvement of maxillary sinus in maximum (50%) patients, anterior ethmoids in 40%, posterior ethmoids in 30% comparable to our observations.

Postoperative subjective improvement

Improvement in headache was 89% postoperatively. Furthermore, the relief in nasal obstruction was by 91%, in nasal discharge 76%, post nasal drip in 86% & aural fullness by 95% respectively. We found statistically significant difference(p=0.0165) in the postoperative subjective improvement. In a similar study by Verma et. al, comparable results were found, relieve in nasal obstruction by 80% & 87%, in rhinorrhea 67% & 75%, in headache by 58% & 75% in septoplasty & septoplasty + FESS respectively. Chandrashekarappa et. al, also noted postop reduction in nasal obstruction by 84%, headache by 82% & post nasal drip by 74%. Batra et.al(16) & Behin et.al(17) showed 91% of improvement in headache after surgical intervention.

CONCLUSIONS

Headache related to the sinonasal inflammation and infections are very common. Chronic sinusitis remains a possible source of headache, but mucosal contact point as a source of headache remains contentious. In the cases associated with rhinogenic headache, it aided the direct visualization of contact points, which can be later confirmed on CT. Surgical correction of obvious anatomicabnormalities in selected patients can significantly improve symptoms. It can abolish headache completely or decrease its intensity and frequency.

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