

Original Research Article

Nasal endoscopic evaluation of patients presenting with frontal headache

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Received: 20 September 2019

Revised: 25 November 2019

Accepted: 27 November 2019

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ABSTRACT

Background: Headache is a universal symptom affecting most people at some point in their lifetime. The most common cause of headache in ENT is acute sinusitis or an acute exacerbation of chronic sinusitis. Anatomic variations like a massive concha bullosa, enlarged ethmoidal bulla, laterally rotated uncinate can interfere with mucociliary clearance. Thus, a thorough nasal endoscopic evaluation will help us to detect any anatomic abnormality which may predispose to sinogenic headache.

Methods: 100 patients with frontal headache underwent diagnostic nasal endoscopy and all anatomic variations and pathological abnormalities were noted

Results: 83% cases had a diagnosis of deviated nasal septum or rhinosinusitis, and the rest 17% had non sinonasal cause for headache

Conclusions: Anatomic abnormalities like middle turbinate anomaly, spur, enlarged bulla, hyperplastic uncinate and pathological abnormality like mucopurulent discharge, polypi can be diagnostic of sinogenic cause for frontal headache.

Keywords: Diagnostic nasal endoscopy, Frontal headache, Deviated nasal septum

INTRODUCTION

Headache is a universal symptom affecting most people at some point in their lifetime.¹ Around 90% suffer from headache over a 12 month period. Headache or cephalgia is defined as diffuse pain in various parts of the head with pain not confined to the area of the distribution of any particular nerve.² A multidisciplinary approach is required to diagnose the causative factors of headache.³ The most common cause of headache in ENT is acute sinusitis or an acute exacerbation of chronic sinusitis.⁴ Anterior rhinoscopy with a nasal speculum and headlight allows visualization of only septum and anterior portion of the inferior turbinate, while the rest of the nasal cavity remains obscure.⁵ Hence, a nasal endoscopy is mandatory in the diagnosis of sinusitis. A

normal nasal cavity, showing no evidence of middle meatal mucopus or inflammatory changes makes a diagnosis of sinogenic pain most unlikely.⁶

Rhinosinusitis affects more than 16% of the adult population annually. It is defined as inflammation of nasal and paranasal sinus mucosa. Computerized tomography (CT) of the paranasal sinuses is used in the diagnosis of chronic rhinosinusitis. There is a high correlation between the endoscopic findings and CT examination.⁷ Anatomic variations like a massive concha bullosa, enlarged ethmoidal bulla, uncinate rotated laterally can interfere with mucociliary clearance.⁵ Hence this study aims to find out the endoscopic anatomical variations and their significance in patients with frontal headache.

METHODS

This study included patients presenting with history of frontal headache attending the ENT outpatient department of R. L. Jalappa hospital, Kolar, between January 2014 to July 2015. All the patients in the age group of above 18 years suffering from frontal headache. Patients who had serious illness, history of previous head injury, cerebrospinal fluid rhinorrhea, benign and malignant tumours of brain/head and neck were excluded from the study.

All the patients satisfying the criteria of selection were subjected to a detailed history regarding headache and its associated symptoms like nasal obstruction, rhinorrhea, postnasal drip, change in smell, history of sneezing. Any other symptoms noticed by the patient such as decreased vision, photophobia, aura associated with the headache, physical and mental stress, neck pain/stiffness below were also documented. Following thorough history taking as mentioned above, patients were subjected to a detailed examination of the nose and paranasal sinuses. All the patients were then subjected to a nasal endoscopic examination and abnormalities recorded.

RESULTS

Most of the patients were in the belonged to less than 30 years of age. Geographical distribution of headache was seen more in the urban population, which comprised of more than 90% cases. Migraine showed a female preponderance. In patients with sinusitis ratio of male to female was 1.28:1.

More than 50% patients had headache of duration, less than or equal to 1 year. Patients with a provisional diagnosis of rhinosinusitis suffered from a more chronic headache compared to the incidence in patients with non sinonasal headache.

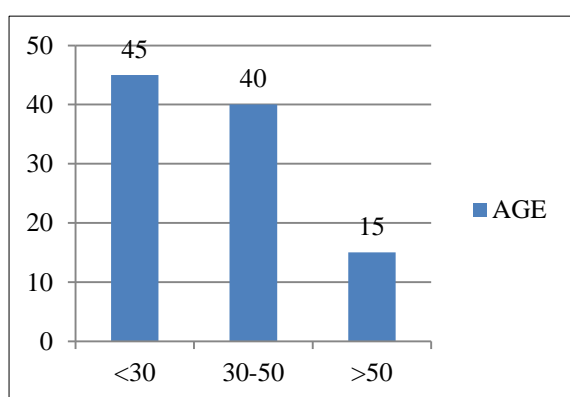


Figure 1: Age distribution in patients with frontal headache.

In this study, 63% had nasal obstruction, 43% had rhinorrhea, 40% with postnasal drip, 15% with history of allergy and 7% with anosmia. Around 87% patients with

deviated nasal septum (DNS) causing headache had nasal obstruction as a predominant symptom.

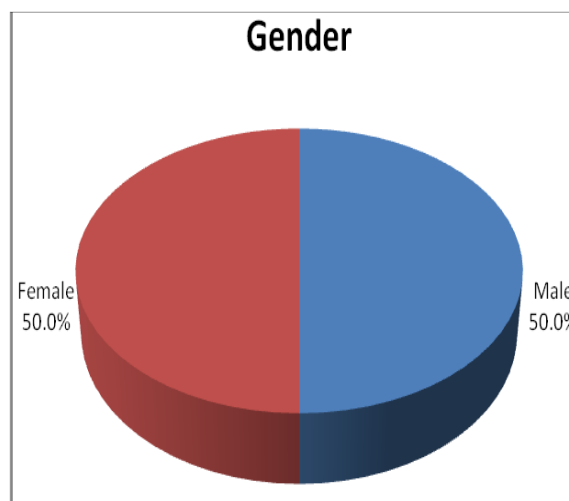


Figure 2: The gender distribution in patients with frontal headache.

Variations of middle turbinate noted were hypertrophic turbinate in 7%, duplication in 1%, medialized in 5%, paradoxical in 11% and polypoidal turbinate in 12% cases with frontal headache. All these variations were seen in patients with sinonasal headache except one case each of polypoidal and hypertrophied middle turbinate which were noted in 2 cases with migraine.

This study showed mucopurulent discharge in 48% cases, while 2% had polypoidal mucosa in the middle meatus and all these changes were noted in patients with sinusitis as the final probable diagnosis. Presence of accessory osteum was seen in 8% of patients with frontal headache, out of which 2% was in patients without a sinonasal cause for headache. In this study, hyperplastic uncinata had a prevalence of 9% and all these patients had sinusitis.

Nasal endoscopy showed 21% patients with nasal polyp, out of which 12% had bilateral ethmoidal polypi while 1% had left and 8% right Antrochoanal polyp respectively. In this study, 9% with headache had an enlarged ethmoid bulla and all these patients had sinusitis.

Lund et al endoscopic score was calculated in all patients with sinusitis which constituted 64% of the patients. The maximum score in the study was 14 and minimum 0. More than 45% cases had an endoscopic score of 6 to 9. All patients with pansinusitis had a score of 6 and above.

CT of paranasal sinuses were done in 46% of cases with frontal headache. Lund and Mackay scoring were used to grade the CT paranasal sinus in patients with sinusitis. Maximum score of 24 and minimum score of 1 recorded. Endoscopic and CT scores were comparable.

Table 1: Symptoms in patients with sinusitis and DNS.

Symptoms	% of sinusitis	% of DNS
Nasal obstruction	63	87
Rhinorrhoea	43	39
Postnasal drip	40	21
Allergic symptoms	15	21
Anosmia	12	0

Table 2: Middle turbinate variations on diagnostic nasal endoscopy.

Middle turbinate	Frequency	%
Concha bullosa	12	12.0
Duplication	1	1.0
Medialized	5	5.0
Middle turbinate hypertrophy	7	7.0
Polypoidal	12	12.0
Paradoxical	11	11.0

Table 3: Diagnosis of patients with frontal headache.

Provisional diagnosis	Frequency	%
DNS to left with spur	10	10.0
DNS to right with spur	5	5.0
S shaped DNS	4	4
Maxillary sinusitis	21	21.0
Frontal sinusitis	2	2.0
Frontoethmoidal sinusitis	1	1.0
Frontomaxillary	9	9.0
Ethmoidomaxillary	5	5.0
Ethmoidomaxillaryshenoidal	3	3.0
Frontoethmoidomaxillary	7	7.0
Bilateral polyposis	12	12.0
Left AC polyp	1	1.0
Right AC polyp	9	9.0
Pansinusitis	16	16.0
adenoiditis	1	1.0
allergic rhinitis	7	7.0
preseptal cellulitis	1	1.0
Left dacryocystitis	1	1.0
Migraine	5	5.0
Cervical spondylitis	2	2.0
Refractory error	4	4.0
Tension headache	6	6.0

A provisional diagnosis of headache due to sinonasal cause was achieved in 83% while only 17% were diagnosed as non-nasal causes like migraine, refractory error, tension headache etc. Headache due to DNS with spur without an underlying sinusitis was seen in 19 % cases. A diagnosis of sinusitis causing headache was seen in 64% cases, out of which 60% had maxillary component of sinusitis, 35% had frontal, 33% had ethmoidal, 19% had sphenoidal component of sinusitis.

DISCUSSION

Headache is one of the most common presenting symptoms encountered by any physician. Around 95% young women and 91% young men suffer from headache over a 12 month period.⁸ It is the ninth most common symptom which brings a patient to the physician.³ Frontal is the most common site of headache, which accounts for 60% of patients with headache.^{8,9}

The patients with headache may approach a physician, neurologist, ophthalmologist or an otorhinolaryngologist. Due to the diversity of the symptomatology, sinonasal cause for headache may be effectively ruled out by a thorough clinical examination and diagnostic nasal endoscopy.⁹ Hence, this study was conducted in R. L. Jalappa Hospital for one and half years during the period from January 2011 to July 2012 to determine the abnormalities on nasal endoscopic examination of patients presenting with frontal headache. A sample population of 100 was included in the study.

Sex predilection in headache was seen in migraine where females were found to be more commonly affected than males. In sinusitis both the sexes were found to be equally affected.¹⁰ Similar results were seen in this study. Migraine showed a female preponderance. In patients with sinusitis ratio of male to female was 1.28:1, which was similar to the result of another study by Ling.¹¹

The incidence of headache increases with age.¹⁰ In an Indian study by Kirtane, majority of the patients (78%) were in third decade which was similar to this study which also had 45% patients in third decade.¹²

Geographical distribution of headache was seen more in the urban population, which comprised of more than 90 % cases. This is in accordance with a study which reported an increased incidence of Chronic rhino sinusitis in people living in urban area.¹³

More than 50% patients had headache of duration, less than or equal to 1 year. Patients with a provisional diagnosis of rhinosinusitis suffered from a more chronic headache compared to the incidence in patients with non sinonasal headache.¹⁴

Diurnal variation of the headache was seen in 15% of the patients in this study, of these more than 10% were seen in patients with sinonasal headache as proved in the literature.¹⁵ In patients with non sinonasal cause for headache, diurnal variation was seen in 4 patients, 2 with cervical spondylosis and rest had tension headache. All these patients had increase in headache towards evening which has been proven in literature.^{16,17}

In this study, the most common symptom to be associated with headache was nasal obstruction in 58%, followed by rhinorrhea in 33%, postnasal drip in 20%, history of allergy in 14% and anosmia in 7% cases. Other

associated symptoms noted were facial pain in 38 % cases, all of whom had sinusitis. According to a study by Lanza, facial pain was a major factor in detecting rhinosinusitis.¹⁸

In a study conducted in 2011, patients with chronic rhinosinusitis had nasal discharge in 100%, nasal obstruction in 98%, throat irritation in 82%, allergic symptoms in 60% and anosmia in 12% and facial pain in around 20%.⁷ In this study, 63% had nasal obstruction, 43% had rhinorrhea, 40% with postnasal drip, 15% with history of allergy and 7% with anosmia which is similar to another study conducted.¹⁹

All the patients with anosmia had eventually bilateral ethmoidal polypi on examination. Around 87 % patients with DNS causing headache had nasal obstruction as a predominant symptom. The most common presentation in patients with DNS was nasal obstruction (85%) according to a study by Hassan.²⁰

Non sinogenic causes of frontal headache had associated symptoms like stress, difficulty in vision, cervical pain etc., which is in accordance with several other studies.^{16,17}

On examination, postnasal drip was seen in 22% cases, tonsillar hypertrophy in 4%, retracted tympanic membrane in 3% and 3% cases had chronic suppurative otitis media. According to another study, 10% had retracted tympanic membrane; postnasal drip was seen in 73% cases of rhinosinusitis.⁷ The lower incidence of the results of this study could be due to inclusion of patients with non sinogenic headache.

In this study, only 53% cases with paranasal sinus tenderness had rhinosinusitis. Thus, tenderness of paranasal sinus does not confirm sinus disease which is in accordance with literature.²⁹

On diagnostic nasal endoscopy, DNS was seen in 82% patients, out of which 39% had DNS to left, 36% to right and rest had S shaped DNS. In literature, various studies give prevalence of DNS from 3 to 96%.^{7,22,23} Study had a result comparable to a study by Danese. A DNS can impinge upon the lateral wall of nose and cause obstruction of drainage of the sinuses leading to infection.

On comparison of DNS detected on anterior rhinoscopy and diagnostic nasal endoscopy, 1 more patient with DNS could be detected on diagnostic nasal endoscopy. The nasal endoscopy could detect posterior deviations and spur better than anterior rhinoscopic examination according to this study.

Hypertrophy of inferior turbinate was seen in 41%. Unilateral inferior turbinate enlargement occurred mainly as a result of compensatory hypertrophy due to DNS on the opposite side. An associated septal spur impinging on

the inferior turbinate results in frontal headache according to a study by Blaugrund.²⁴

Variations of middle turbinate noted were hypertrophic turbinate in 7%, duplication in 1%, medialized in 5%, paradoxical in 11% and polypoidal turbinate in 12% cases with frontal headache. All these variations were seen in patients with sinonasal headache except one case each of polypoidal and hypertrophied middle turbinate which were noted in 2 cases with migraine. In a study conducted, paradoxical turbinate was seen in 8.5%.²¹ Concha bullosa was noted in 12% cases and out of these 9% had sinusitis while the rest had DNS with spur causing frontal headache. It was the most common anomaly of the middle turbinate. Enlarged middle turbinate could cause mucosal contact point with the lateral wall structures resulting in sinusitis.²⁵

This study shows mucopurulent discharge in 48% cases, while 2% had polypoidal mucosa in the middle meatus and all these changes were noted in patients with sinusitis as the final probable diagnosis which was confirmed by either X-ray or CT of paranasal sinuses. Various authors have shown that the presence of mucopurulent discharge is a definitive tool for diagnosis of sinusitis in patients with frontal headache.^{26,27}

Presence of accessory osteum was seen in 8% of patients with frontal headache, out of which 2% was in patients without a sinonasal cause for headache. Thus, presence of accessory osteum in presence of mucopurulent discharge only indicates sinonasal headache. Other studies in the country show that, accessory osteum was seen in 22% cases and does not indicate sinusitis.

In this study, hyperplastic uncinata had a prevalence of 9% and all these patients had sinusitis. This is slightly less compared to another study by Liu et al, which reports an incidence of 19%.²⁸ A hyperplastic uncinata may obstruct the osteum and predispose to sinusitis.

Nasal endoscopy showed 21% patients with nasal polyp, out of which 12% had bilateral ethmoidal polypi while 1% had left and 8% right antrochoanal polyp respectively. This is higher than the incidence of 5% quoted in another a study conducted in Africa by Fasunla.⁷ More than 50% of patients with bilateral ethmoidal polypi had history of allergy which has been proved theoretically.²⁹ These pathological findings in patients with frontal headache are definitive diagnosis of sinusitis.

The ethmoidal bulla is the largest and the most constant anterior ethmoidal air cell. An enlarged bulla can cause obstruction to the osteomeatal complex leading to frontal, maxillary or ethmoidal sinusitis. In this study, 9% with headache had an enlarged ethmoid bulla and all these patients had sinusitis. This is slightly lower than the incidence of 17% noted in another study by Lloyd.³⁰

Lund et al endoscopic score was calculated in all patients with sinusitis which constituted 64% of the patients. The maximum score in the study was 14 and minimum 0. More than 45% cases had an endoscopic score of 6 to 9. All patients with pansinusitis had a score of 6 and above. Hence, it was found that greater the endoscopic score, more severe the grade of sinusitis.

X ray of paranasal sinuses, Waters view was taken in all the patients. In some patients with normal X-ray paranasal sinus and positive nasal endoscopy, CT paranasal sinuses detected disease in the paranasal sinuses. Hence in study it was found that Nasal endoscopy was a better tool in assessing headache compared to X-ray paranasal sinuses which is in accordance with several other studies.³¹

CT of paranasal sinuses were done in 46 % of cases with frontal headache. Lund and Mackay scoring was used to grade the CT paranasal sinus in patients with sinusitis. Maximum score of 24 and minimum score of 1 recorded. Endoscopic and CT scores were comparable. Higher the endoscopic score, greater the CT score. This is in accordance in a study by Rosbe, who found that nasal endoscopy was moderately sensitive and highly specific in predicting results of CT scanning.

In patients with provisional diagnosis of DNS with spur, 52.6% underwent septoplasty and 45.3% with rhinosinusitis underwent functional endoscopic sinus surgery.

A provisional diagnosis of headache due to sinonasal cause was achieved in 83% while only 17% were diagnosed as non-nasal causes like migraine, refractory error, tension headache etc., which is similar to study by Kennedy.²⁵ In another study by Foroughipur, migraine, tension headache and sinusitis was the final diagnosis in 68%, 27% and 5% of patients with chronic headache respectively. This could have been due to diagnosis without nasal endoscopy in those patients.⁴

Headache due to DNS with spur without an underlying sinusitis was seen in 19% cases. This is in accordance with another study by Qubilat which reports an incidence of 23-58%. This shows that a DNS may come in physical contact with lateral nasal wall structures causing headache. It may also block the sinus ostium leading to vacuum headache. Hence DNS with spur should be taken as a significant finding in patients with frontal headache.

All patients with acute sinusitis can present with frontal headache. A diagnosis of sinusitis causing headache was seen in 64% cases, out of which 60% had maxillary component of sinusitis, 35% had frontal, 33% had ethmoidal, 19% had sphenoidal component of sinusitis. This is in accordance with several other studies, which show that maxillary sinus is most commonly involved in headache.³²

CONCLUSION

This study was mainly undertaken to detect nasal endoscopic findings in patients with frontal headache. Both diagnostic nasal endoscopy and CT imaging of paranasal sinus are important preoperative evaluation tools in detecting pathology and both are complimentary to each other. Middle turbinate abnormalities like paradoxical turbinate, medialization, polypoidal, duplication of the turbinate, concha bullosa and other lateral nasal wall anomalies like enlarged ethmoidal bulla, hyperplastic uncinata can all cause blockage of osteomeatal complex, thereby interfering with the drainage of the paranasal sinuses, leading to sinusitis and headache. Presence of mucopurulent discharge is a pathognomonic sign of underlying paranasal sinus disease. Sinonasal anomalies should be primarily considered as the cause for frontal headache in view of positive nasal endoscopic findings.

Hence all patients with frontal headache should be subjected for diagnostic nasal endoscopy.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Ravunniarth LM, Narayana GK. Nasal endoscopic evaluation of patients presenting with frontal headache. *Int J Otorhinolaryngol Head Neck Surg* 2020;6:137-42.