

Headache & Sinus Disease- A Clinical Study

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ABSTRACT

Introduction: Headache is considered as pain felt somewhere within the head. Classification of headache into superficial & deep types is helpful in locating the source of headache. Infections of the frontal, maxillary & sphenoid sinus can be accompanied by considerable pain, especially when their ostia are blocked and retention of secretion occurs, often giving rise to a pounding pain. The objective of this study was to obtain detailed history & conduct physical examination along with relevant investigations leading to formation of an appropriate headache diagnosis for the patients & provide them with treatment appropriate for the diagnosis.

Materials & methods: The present study has been conducted in 100 patients complaining of headache reporting either in OPD or admitted in the wards, Department of Otorhinolaryngology, Major S D Singh Medical College, Farrukhabad. The patients were subjected to detailed history taking & various investigations including the routine like hemogram, urine, fundus examination & specific like anterior & posterior rhinoscopy, transillumination test, radiological investigations like X-ray paranasal sinuses, X-ray skull & X-ray cervical spine.

Result: Follow up was possible only in 78 cases as the remainder did not turn up. Majority of the patients fell in the age group of 10-30 years. Amongst the predominant symptoms displayed by patients, headache was present in all the cases. Nasal obstruction & nasal discharge embraced almost equal frequency, 47% & 43% respectively. Majority of patients complained of headache in the region of forehead (43%). Headache at more than one site was present in 19% cases while headache was experienced at the site of glabella & temporal regions in 12% and 17% respectively. Caldwell- Luc's operation was performed in 12 patients and intranasal polypectomy was required in 3% patients out of all.

Conclusion: Headache is a symptom, not a disease. It is a complaint, not a diagnosis. Headache, nasal obstruction and nasal discharge are the commonest presenting symptoms in sinogenic headache. Diagnosis of sinogenic headache is done by the clinical history, examination of nose and paranasal sinuses and relevant investigations besides excluding the headaches of nonsinogenic and psychogenic cause.

Key Words: Headache, sinus disease, paranasal sinus, psychiatry.

INTRODUCTION

Headache is considered as pain felt somewhere within the head. Facial pain & tenderness, especially immediately over sinuses is also included. Superficial pain is of bright burning quality, is associated with

an increase in blood pressure & movement & "exactly locates the site of mischief". The deep pain on the other hand has a dull aching quality, is associated with the involvement of muscle & blood vessel & a drop in blood pressure, slowing of pulse &

associated often with nausea. The most characteristic feature of deep pain is its tendency to be felt at a distance from the source; hence also includes referred pain. Classification of headache into superficial & deep types is helpful in locating the source of headache. When present in chronic sinusitis the headache seen is of deep type with referral to a distant point from its source.

Spriggs [1] found that in only 3% of 500 patients with chronic sinusitis & a major complaint of headache, could the condition be attributed to this disease.

Headache patients come to the emergency department for one of the two reasons: either the headache is the most recent in a seemingly endless series of similar headaches so that the patient arrives because of frustration, exhaustion or despair- "the last straw syndrome"; or the headache is sufficiently different or sufficiently intense to alarm the patient - "the first or the worst syndrome". [2]

There are two types of headache which should raise immediate suspicion that the source of the headache is in a sinus. The first is a headache in the region of the forehead caused by a loculated infection in a division of a frontal sinus, particularly in a cell in the interfrontal septum. [3] This headache is characteristically brought on or made worse by any attempt to do work. Such patients are frequently diagnosed as having conversion disorder.

The second type of headache has many characteristics of the histaminic cephalgia described by Horton. [4] This pain is episodic, rapid in onset, of great severity, but of relatively short duration. It tends to occur more frequently in the early morning, waking the patient from sleep. It was demonstrated that blocking the area in the region of the posterior tip of the middle turbinate with cocaine would diminish & sometimes cause the frontal pain to stop. This suggests a reflex arc through the fifth cranial nerve as was suggested by Dysart. [5]

MATERIALS & METHODS

The present study has been conducted in 100 patients complaining of headache reporting either in OPD or admitted in the wards, Department of Otorhinolaryngology, Major S D Singh Medical College, Farrukhabad,. The patients were subjected to various relevant investigations e.g hemogram, urine, fundus examination, radiology& histopathological examination. The patients were categorized into 3 groups:

1. Those with headaches clearly traceable to non- sinus causes such as migraine, neuralgias, cervical spine disorders, too low/high blood pressure or other vascular disorders. (ice cream headache), temporomandibular joint disease, ophthalmic refraction problem, allergies etc.
2. Those with headache clearly connected to some sinus problem, such as inflammatory disease, neoplastic, barotrauma or another readily identifiable cause.
3. Those whose problems are not clear and in whom there seems to be the overt indication of sinus disease. It is this group of patients that can present a very rewarding challenge for the endoscopist.
4. Psychogenic headache.

The necessary sociodemographic information regarding the patient & other relevant features were recorded under the following heads: name, occupation, age, sex, presenting complaints, personal history including diet/ appetite/ sleep/ bowel/ bladder/intoxication, family history.

General examination of the patients was done for general condition, dehydration, pallor, icterus, lymphadenopathy, cyanosis, clubbing, koilonychia, pulse, temperature, blood pressure, respiration rate.

Systemic examination was done for central nervous system, cardiovascular system, respiratory system, per abdominal examination.

Local examination included external examination of face, anterior rhinoscopy,

posterior rhinoscopy & transillumination test of nose, examination of throat, ear & indirect laryngoscopy of larynx.

Routine investigations included hemogram, urine routine & microscopy, blood urea, blood glucose, stool for ova & cyst. Radiological examination included X-ray of paranasal sinuses, x-ray skull, X-ray cervical spine, nasal smear for cytology, histopathology.

RESULTS & OBSERVATION

A clinical study of 100 patients complaining of headache reporting either in ENT OPD or admitted in ENT wards of Major S.D Singh Medical College, Farrukhabad was undertaken from 1 march 2017 to 31 august 2017. Follow up was possible only in 78 cases as the remainder did not turn up or could not be contacted. Majority of the patients fell in the age group of 10-30 years (Table 1). Both the sexes were affected equally with a slight preponderance of male patients (53%) (Table 2). Majority of cases were Muslims (65%) & only 35 % were Hindus. Majority of the patients belonged to the middle class group. All the patients were married except 5 patients who were not married. Minor symptoms like blurring of vision, blackouts, lack of interest in the surroundings, although not taken into account by the patients, were found to have duration ranging between 5 months to 10 years (77%) followed by 1 to 5 months in 14 % patients & 1 week to 1 month in 9 % patients. Four important complaints were narrated by the patients and duration of these complaints varied from 1 week to 10 years as is evident in Table 3 & Table 4. Amongst the predominant symptoms displayed by patients, headache was present in all the cases. Nasal obstruction & nasal discharge embraced almost equal frequency, 47% & 43% respectively. Change in voice was the least common complaint found i.e. in 19 patients only.

Majority of patients complained of headache in the region of forehead (43%). Headache at more than one site was present

in 19% cases while headache was experienced at the site of glabella & temporal regions in 12% and 17% respectively. A small percentage of patients (9%) demonstrated headache at the top of head.

Amongst 100 patients, 90 had apparently an average built and their hematocrit value varied between 65 to 70 % while the rest 10cases were severely anemic and their hematocrit value varied between 30 to 35%.

No significant cardiac abnormality was observed other than 10 patients having hemic murmur. No neurological abnormality in any form was found to be associated in any patient barring weakness of the eye muscle in 19 cases. Papilloedema was observed only in 2 patients. Headache related with vascular disorders was found in 17 patients. 3 patients of migraine had severe headache associated with nausea and vomiting which was relieved by giving ergot preparation. Majority of non sinogenic headache fell in the group of cervical spine disorder (30%). 8 patients were found psychogenic as the necessary investigation and examination did not favour any specific etiology & were referred to psychiatrist.

External examination of face did not exhibit any deformity except tenderness in the region of maxillary sinus in 9 patients. Supraorbital tenderness was seen in 3 patients. External examination of nose exhibited slight deviation of dorsum of nose towards left side in 2 patients. On anterior rhinoscopy, nasal polypi were present on right side of nasal cavities in 2 patients. Mucopurulent and purulent nasal discharge was present in the middle meatus in 23 patients. On posterior rhinoscopy, nasal polypi were seen on right side in 2 patients only.

Transillumination test was carried out in all the patients in the present study. It was non refractory bilaterally in 16 patients and unilaterally in 7 patients for maxillary sinuses. The test was also done for frontal sinuses which did not reveal an abnormality. Ocular muscle weakness was observed in 19

patients while 2 had papilledema on fundus examination.

Refractive error was seen in 19 patients. 17 patients had post nasal discharge which was evident in the region of posterior pharyngeal wall. Retraction of the right tympanic membrane was observed in two patients while single patient had retraction of left tympanic membrane. No pathology was observed in larynx in either patient. Hematological investigation revealed that the general blood picture was normocytic normochromic in 90 patients while 10 had normocytic hypochromic. ESR (erythrocyte sedimentation rate) was raised in 83 patients. Radiological examination of paranasal sinuses (occipito-mental view, submento- vertical view, lateral view & occipito-frontal view) was performed on all the patients. It demonstrated hazyness & thickening of antral mucosa bilaterally in 7 patients and unilaterally in 9 patients. Two patients had radiological evidence of antral polyp on right side while only one on left side. Slight exudation was present bilaterally in 4 patients. No abnormality was seen in the frontal sinus. Radiology of cervical region exhibited osteophytes and osteoarthritis in 30% patients.

Culture sensitivity of nasal swab showed the growth of Staphylococcus albus and Staphylococcus aureus in 9 patients which were sensitive to gentamicin, cotrimoxazole, ampicillin & chloramphenicol.

Fundus examination of both eyes showed papilloedema and retinal hemorrhages on the left sides in 2% patients.

The mucosa of the nose exhibited inflammatory red appearance with hypertrophy of middle and inferior turbinates and exudation in 9% patients. Pale and allergic nasal mucosa was seen in 5% patients bilaterally.

The histopathology of the mucosa of the paranasal sinuses showed allergic mucosa in 5% patients, inflammatory mucosa in 9% patients and suppurative changes in 7%. There was no evidence of

atrophic changes in mucosa of the paranasal sinuses.

10 patients with low hematocrit were given parenteral administration of iron supplemented with oral administration of iron folic acid and high protein diet to build up patients preoperatively.

Only two patients received medical treatment for sinogenic headache and they responded well. 8% patients of psychogenic headache were given psychotherapy and were referred to psychiatrist for their better management. 69% patients of non sinogenic headache fell in the following disorders:

- Cervical spine disorders - 30%
- Ophthalmic disorders- 19%
- Vascular disorders- 17%
- Migraine - 03%

All these patients were treated medically according to their causes.

Caldwell- Luc's operation was performed in 12 patients and intranasal polypectomy was required in 3% patients out of all. Antral puncture was done in 3% patients bilaterally and there was mucopurulent wash. 5% patients had purulent antral wash unilaterally. Intranasal antrostomy on left side was done in one patient. Antral mucosa tissue was sent for histopathological examination and the antral washings were sent for culture and sensitivity examination.

Table 1. Headache in relation to age groups (n=100)

S.NO.	AGE GROUPS	NO. OF CASES	PERCENTAGE
1.	10-20 YEARS	27	27
2.	21-30 YEARS	38	38
3.	31-40 YEARS	20	20
4.	41-50 YEARS	08	08
5.	51-60 YEARS	07	07

Table 2. Headache in relation to sex (n=100)

S.NO.	SEX	NO. OF CASES	PERCENTAGE
1.	MALE	53	53
2.	FEMALE	47	47

Table 3. Frequency of headache & related symptoms in the patients (n=100)

S.no.	Symptoms	No. Of cases	Percentage
1.	Headache	100	100
2.	Nasal obstruction	47	47
3.	Nasal discharge	43	43
4.	Change in voice	19	19

Table 4. Duration of illness in the patients (n=100)

S.no.	Duration of illness	No. Of cases	Percentage
1.	1 week	6	6
2.	1week to 1 month	3	3
3.	1 month to 5 months	14	14
4.	5 months to 10 years	77	77

DISCUSSION

The present clinical study has been carried out in 100 patients of headache with special attention to its sinus disease. Patients with predominant complaint of headache were included in this study from 1 march 2017 to 31 august 2017, either from ENT OPD or admitted patients of Major S.D Singh Medical College, Farrukhabad.

Since patients with sinogenic headache may not present necessarily with a typical sinusitis history, one should investigate for underlying causes with nasal & sinal causation in mind. Wespi et al. [6] shared the view that headache could be of nasal origin. Negative findings with anterior and posterior rhinoscopy and conventional radiographs do not rule out a sinus cause. Diagnostic endoscopy and histopathology in many patients allows detection of lesions hidden from the unaided eye.

We understand that infections of the frontal, maxillary & sphenoid sinus can be accompanied by considerable pain, especially when their ostia are blocked and retention of secretion occurs, often giving rise to a pounding pain. Studies demonstrated that hypoxia in the sinuses is one of the factors that can give sensation of pain. [7] Most rhinologists, among them Cottle, [8] Pellandra, [9] Masing [10] and Ryan, [11] hold the strong belief that septal deformation, especially of traumatic origin, may exert pressure on the sensitive structures of the lateral nasal wall, causing referred pain and chronic pain. Mostly the patients fell in age group of 10-30 years. Both males & females were almost equally affected in this study. Muslims were affected more than Hindus. Majority of the patients belonged to the middle class group. All the patients were married except 5 who were less than eighteen years of age. Duration of complaints varied from 5 months to 10 years. The shortest duration as observed in this study ranged from 1 week to 1 month. In the present study four important symptoms were narrated by the patients viz. headache, nasal obstruction, nasal discharge, change in voice. Majority

of the patients complained of headache in the region of forehead. It was followed by headache at more than one site (diffuse headache). The least common sites were glabella & temporal regions. Amongst 100 patients 90 had apparently an average built and only 10 patients were anemic. No significant cardiac, respiratory pathology was observed.

No neurological abnormality in any form was found to be associated in any patient except weakness of the eye muscle in 19 patients. Papilloedema was observed in only 2 patients. Headache related with vascular disorders was found in 17 patients. 3 patients of migraine had severe headache associated with nausea and which was relieved by giving ergot preparation. Sutherland [12] & Wolf [13,14] stated that it was their opinion that in headache of migraine the extracranial and possibly the dural branches of the external carotid artery are involved, although the possibility exists that the anterior meningeal artery, the superficial frontal artery, and the supraorbital artery may contribute to the pain. Since Wolf was of the opinion that histaminic cephalgia is a migraine variant, it seems probable that he assumed that similar vessels are involved.

From this study, it is possible to say that external examination of face did not exhibit any deformity except tenderness in the region of maxillary sinuses in 9 patients. Supraorbital tenderness was present in 3 patients. Our study showed that external examination of nose exhibited deformity of dorsum of nose towards left side in 2 patients. On anterior rhinoscopy, nasal polypi were present on right side of nasal cavities in 2 patients while only one patient had nasal polyp on left side. Mucopurulent and purulent discharge was present in the middle meatus in 23 patients. Posterior rhinoscopy revealed nasal polypi on right side in two patients only. Similar findings were observed by Messerklinger. [15] The sinal involvement of the maxillary antrum of one side was observed. This was indicated by roentgenography and and

positive antral puncture. In each instance washing out thick pus from the homolateral maxillary sinus resulted in relief from the pain syndrome of an indefinite duration.

Transillumination test was non-refractory bilaterally in 76 patients and unilaterally in 7 patients for maxillary sinuses. This shows an evidence of thickening or polypoidal changes of mucosa of the antrum. The test was also done for frontal sinuses which did not reveal any abnormality.

In the present study, ocular muscle weakness was observed in 19 patients while 2 patients had papilloedema on fundus examination. Refractive errors were seen in 19 patients. The study showed that 17 patients had post nasal discharge which was evident in the region of posterior pharyngeal wall.

Two patients had retraction of right tympanic membrane while single patient had retraction of left tympanic membrane. None of the patients had perforation of tympanic membrane.

The present study showed larynx within the normal limits. In our study, hematological investigations yielded valuable information. In 90 patients, general blood picture was normocytic normochromic while in 10 patients it was normocytic hypochromic. ESR was raised in 83 patients.

All the patients were advised for radiological examination of paranasal sinuses (occipito- mental view, submento- vertical view, lateral view & occipitofrontal view). It demonstrated haziness and thickening of antral mucosa bilaterally in 7 patients and unilaterally in 9 patients. Our study shows that two patients had radiological evidence of antral polyp right side while only one on left side. Slight exudation was present bilaterally in 4 patients. No abnormality was seen in frontal sinus, sphenoidal sinus & ethmoid air sinus.

Radiology of cervical region exhibited osteophytes & osteoarthritis. Culture & sensitivity of nasal swabs showed the growth of *Staphylococcus albus* &

Staphylococcus aureus in 9 patients which were sensitive to gentamicin, cotrimoxazole, ampicillin & chloramphenicol.

In our study, fundus examination of both eyes showed papilloedema & retinal hemorrhages on left sides.

The mucosa of the nose exhibited inflammatory red appearance with hypertrophy of middle & inferior turbinates & exudation in 9% patients. Pale & allergic nasal mucosa was seen in 5% patients bilaterally in the present study. The histopathology of the mucosa of paranasal sinuses showed allergic mucosa in 5% patients, inflammatory mucosa in 9% patients and suppurative changes in 7%. There was no evidence of atrophic changes in mucosa of the paranasal sinuses.

In our study, only two patients received medical treatment for sinogenic headache & they responded well. No recurrence occurred in these patients.

In the present study, Caldwell Luc's operation was performed in 12 patients and intranasal polypectomy was required in 3% patients out of all. Antral puncture was done in 3% patients bilaterally. Cottle et al. [16] emphasized the role of septoplasty surgery in patients of headache of sinogenic origin. Hansen [17] and Koch- Henriksen et al. [18] are also in favour of septal surgery for treatment of chronic headache.

Friedman et al. [19] observed that patients with hyperplastic rhinosinusitis improved by performance of sphenoidectomy.

None of the patients had suffered from complications like osteomyelitis of frontal bone. The most common bone infection associated with sinusitis as reported by Takeshima et al. [20] Infection can spread by the way of the diploic veins or by direct extension. The other complications include meningitis & brain abscess. The most common organism is pneumococcus. Meningitis or brain abscess result from the local extension of sinus disease via defects in sinus bone. Brain abscess from paranasal sinus disease are

known as rhinogenous abscess and usually involve the frontal lobe.

CONCLUSION

Headache is a symptom, not a disease. It is a complaint, not a diagnosis. It is an indication of a provocative cause just as fever or elevated blood pressure; reflect underlying aberration. Headache is a very annoying symptom for patients and also for those trying to treat them. Headaches can be of sinogenic origin even if this cause may not be suspected from the case history. Average age of onset is 25 to 30 years. Sinogenic headache occurs equally in both sexes. Headache, nasal obstruction and nasal discharge are the commonest presenting symptoms in sinogenic headache. Majority of patients belong to middle class group. Localization of headache is observed in the of nose and paranasal sinuses and relevant regions of forehead, glabella & temporal in majority of patients. Diagnosis of sinogenic headache is done by the clinical history, examination of nose and paranasal sinuses and relevant investigations besides excluding the headaches of nonsinogenic and psychogenic cause. Radiological investigation is helpful in determining the involvement of sinuses. Histopathologically the mucosa of sinuses of the patients of sinogenic headache is classified as allergic, inflammatory and suppurative. Surgical treatment is helpful in curing the patients of sinogenic headaches in most of the cases. Only two patients could benefit with medical treatment. Follow up of the patients is helpful in treating headaches of varied etiology. Recurrences are common in patient of headaches of multiple etiology, and more if not treated specifically.

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