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Original Research Article

A clinicopathological study of various aetiologies of headache in otorhinolaryngology

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ABSTRACT

Background: Headache is one of the most common complaints with which a patient presents to an outpatient clinic. Because of the wide range of clinical presentations and etiologies, evaluation of headache is often a challenging problem for the clinician. In our study, we are finding out the possible aetiologies of headache in patients attending the otorhinolaryngology department.
Methods: The patients underwent history taking and ENT examination involving hematological, radiological investigations and all data were recorded by in Microsoft excel Sheet and analyzed with the help of SPSS 20 software for windows.
Results: The 128 (35.9%) patients had otomastoiditis, 120 (33.6%) patients had nasal mass, 33 (9.2%) patients had sinusitis, 29 (8.1%) patients had laryngeal cancer, 14 (3.9%) patients had tongue cancer, 2 (0.6%) patients had parapharyngeal mass and 31 (8.7%) patients had normal findings.
Conclusions: Most common pathologies associated with headache in ENT are otitis externa followed by sympatomatic deviated nasal septum.

Keywords: Headache, Otitis externa, Sinusitis, Otomastoiditis

INTRODUCTION

Headache is one of the most common complaints with which a patient presents to an outpatient clinic. Headache put on great individual and social burden and can cause a decrease in productivity and significant reduction of the quality of life.[1] Despite all the sufferings, a large number of cases of headache go undiagnosed and patients rely on symptomatic treatment and over the counter medication rather than getting a treatment based on the diagnosis. The etiology of the headache may be insignificant and self-limited, or life-threatening and require extensive evaluation and treatment. Because of the wide range of clinical presentations and etiologies, evaluation of headache is often a challenging problem for the clinician. The cranial and cervical nerves that innervate the head and neck supply multiple sites and therefore create various patterns of referred pain. For this reason, the pain that may seem to arise from a distinct region of the head and neck may, in fact, be referred from a different area. Pain from different areas is transmitted via the nociceptors that are sense organs in which painful stimuli produce a response that excites sensory nerve fibers that transmit to brain information about position, intensity, quality and duration of the response. Serotonin and substance P are the main neurochemicals responsible for this excitation. Cranial nerves V, VII, IX, and X and the first 3 cervical nerves carry these afferent fibers to the central nervous system. Thalamic nuclei are responsible for the affective response to pain while localization and intensity recognition is a function of cortical center.[2] The brain's ability to distinguish between various sources of noxious stimuli is limited by the extensive convergence of afferent neurons in brainstem nuclei. This causes

referred pain to tissues with past experience recognized as pain. Pain from supraglottic larynx and tonsillar fossa can be referred to middle ear, pain from temporomandibular joint to ear or cheek, from sphenoid sinus to the occiput.

We have only partial understanding about the several mechanisms causing excitation of nociceptive neurons. One main mechanism is the sustained contraction of muscle causing ischemic changes or production of nitric oxide. Another mechanism is dilation of intracranial arteries stimulating trigeminal sensory pathways that release vasoactive peptides that can increase the pain response. Subtypes of 5HT (serotonin 5-hydroxytryptamine) receptors on the vessel wall is associated with vasodilation. Some subtypes like 5HT1B cause vasoconstriction and inhibits pain response. Antimigraine agents like triptan acts by selectively binding to 5HT1B receptors to produce a response. Pain can also be caused by direct nerve pressure as in foraminal stenosis or by neural inflammation following injury or tumor invasion. Oral contraceptives, alcohol withdrawal, caffeine withdrawal, hypoxia, hypoglycemia, anti-hypertensives like nitroglycerin can trigger headache by causing vasodilation.[3] Also, lowered cortical pain threshold and defective release of endogenous opiates is found in patients suffering from chronic tension headache. Primary headache is defined as a headache which is unrelated to an underlying medical condition and secondary headaches are those caused by an underlying medical condition and thus, patients need to be evaluated thoroughly. Sinonasal diseases are one of the many noted causes of facial pain and referred headache. It is often associated with post nasal drip, nasal obstruction, purulent rhinorrhea and hyposmia. Sometimes patients with agonizing headache present with no active disease or no signs of any sinus inflammation with no evidence of any disease of head and neck or sinus region.

For ages, the conceptual understanding of etiology of headache has been accredited to rhinogenic causes.[15] Sinonasal diseases are one of the many noted causes of facial pain and referred headache. It is often associated with post nasal drip, nasal obstruction, purulent rhinorrhea and hyposmia. Sometimes patients with agonizing headache present with no active disease or no signs of any sinus inflammation with no evidence of any disease of head and neck or sinus region. Many authors have hypothesized that the cause of referred headache in the absence of inflammation is pressure on nasal mucosa due to abnormal anatomy.[4] Pressure on nasal mucosa is associated with disruption of microvascular supply resulting in the release of potent nociceptive chemicals that lower the threshold for pain.

Deviated nasal septum has been conceptualized for ages as an important cause of headache. Deviation of septum combined with anatomical abnormalities of middle turbinate can contribute to contact point headache.[16]

Aim and objectives

Primary aim and objectives

Primary aim and objectives were to find out the various aetiologies of headache in patients attending ENT department.

Secondary aim and objectives

Secondary aims and objectives were to determine the triggering and relieving factors of headache.

METHODS

A prospective observational study of 357 patients with headache from both IPD and OPD in the department of otorhinolaryngology and head and neck surgery Netaji Subhash Chandra Bose medical college, Jabalpur was conducted for a period between 1st of March 2021 to 31st of August 2022.

Inclusion criteria

Patients presenting with headache were included in study.

Exclusion criteria

Patients whose consent was not available and patients with history of head injury were excluded from the study.

Data collection method

This study was carried out in the department of otorhinolaryngology and head and neck surgery of NSCB medical college, Jabalpur. Prior informed consent was taken from all the subjects participating in the study. The cases were selected from both IPD and OPD patients who presented with symptoms of headache. The patients underwent a thorough history taking and clinical examination involving a comprehensive ear, nose, throat and neck examination, hematological investigations, radiological investigations and all data were recorded by using a structured schedule (Case report form) and entered in Microsoft excel sheet and analyzed with the help of SPSS 20 software for windows.

RESULTS

Age distribution

Out of the 357 patients in the study group, maximum prevalence (86 cases) was in the age group 21-30 years.73 cases were in the age group 10-20 years, 66 cases in 31-40 age group, 54 cases in 41-50 age group, 43 cases in 51-60 age group, 26 cases in 61-70 age group and 9 patients in 71-90 age group. The minimum age was 14 years and maximum age of the subjects was 83 years. The mean age of the participants is 36.2.

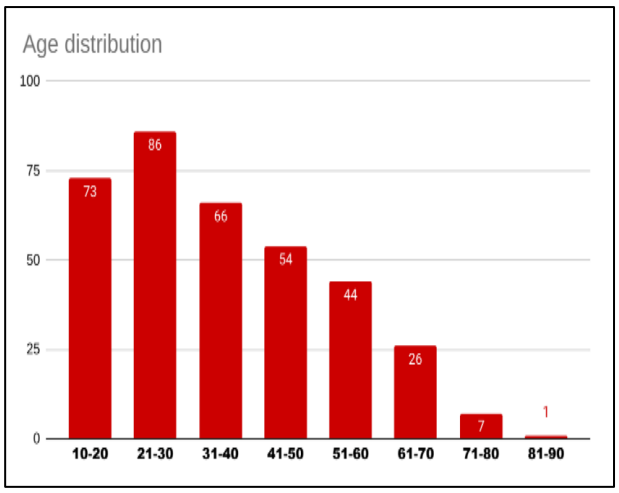

Figure 1: Age distribution of patients.

Sex distribution

In the present study, out of the 357 cases studied males and females were 229 (64.1%) and 128 (35.9%) respectively. The male female ratio is 1.7:1.

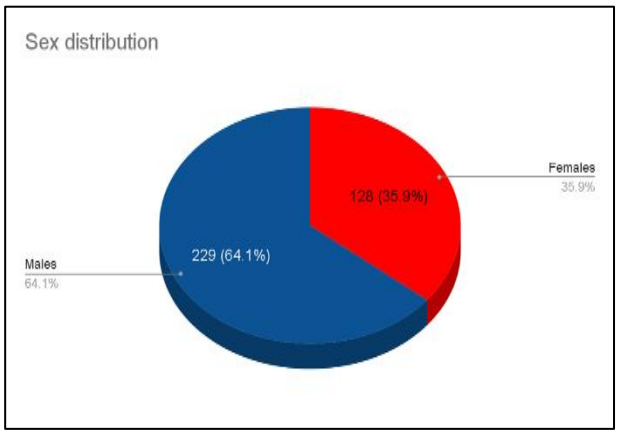

Figure 2: Sex distribution of patients.

Socioeconomic status

The 245 (68.6%) participants were of low socioeconomic status, 75 (21.0%) from middle class and 37 (10.8%) subjects were from high socioeconomic status.

Associated comorbidity

The 59 (16.9%) patients are diabetic, 41 (11.5%) patients are hypertensive and 10 patients (2.4%) had a history of tuberculosis, 3 patients (0.84%) have bronchial asthma.

Duration of headache

The 148 patients (41.5%) had headache for a duration of 0-3 months, 108 patients (30.3%) for 4-6 months, 77 patients (21.6%) for 7-9 months and 24 patients (6.7%) had headache for 10-12 months.

Addiction history

In our study of 357 subjects, 159 (44.5%) subjects are smokers, 52 (14.5%) subjects are alcoholics and 170 (47.6%) subjects have other addictions like paan, gutka chewing.

Triggering and relieving factors

In this study of 357 participants, the most commonly reported triggering factor is common cold (26.8%). This is followed by climate changes (22.9%), food (10.6%) and loud sound (0.56%). The 139 patients reported to have no triggering factors. The 229 (64%) patients out of the 357 subjects taken into study reported to get relief from medicines. The remaining 128 (36%) patients had no relief.

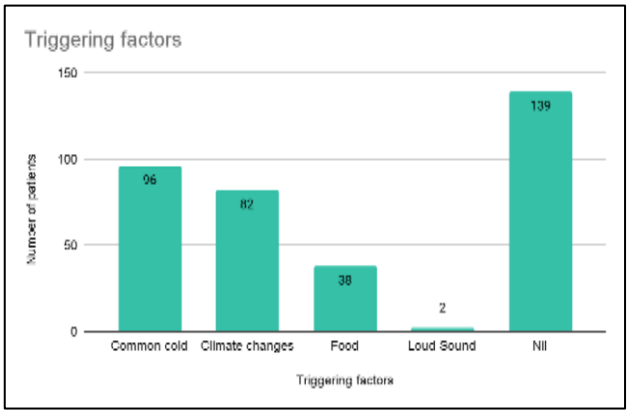

Figure 3: Comparison of triggering factors.

Nasal examination findings

The 240 (67.2%) had symptomatic deviated nasal septum, 104 (29.1%) patients had nasal mass suspicious of malignancy, 24 (6.7%) patients had septal spur, 21 patients (5.8%) had AC polyp, 5 (1.4%) patients had septal perforation, 3 patients (0.8%) had ethmoidal polyp, 3 (0.8%) patients had thickened septum, 85 (23.8%) patients had no significant findings.

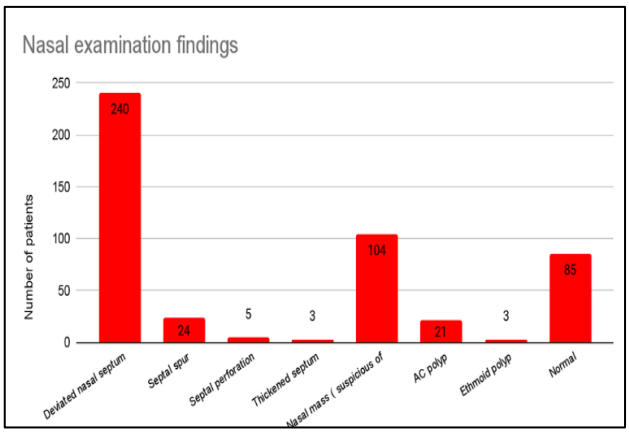

Figure 4: Nasal examination findings.

Otological findings

The 104 (29.1%) patients had attic perforation or cholesteatoma, 40 (11.1%) patients had pars tensa perforation, 107 (29.9%) patients had otitis externa, 21 (5.8%) patients had pre or post auricular abscess, 18 (5.01%) patients had mass in ear and 195 patients had normal findings.

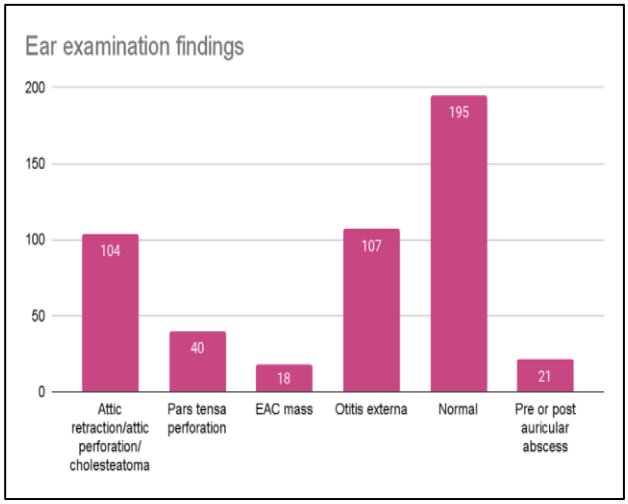

Figure 5: Aural examination findings.

Associated symptoms

The most common associated symptom reported is otalgia experienced by 191 (53.5%) patients. The 131 (36.6%) patients had ear discharge, 124 (34.7%) patients had nasal obstruction, 78 (21.8%) patients had pain while opening mouth, 63 (17.6%) patients had toothache, 29 (8.1%) patients had neck stiffness.

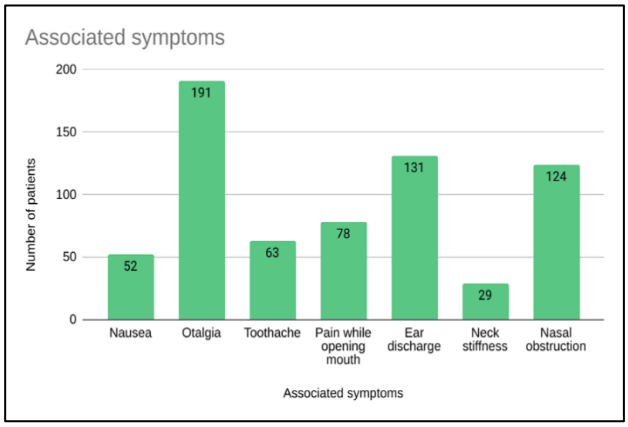

Figure 6: Comparison of other symptoms associated with headache.

Computerized tomography findings

All underwent CT investigation which revealed the following findings, the 128 (35.9%) patients had otomastoiditis, 120 (33.6%) patients had nasal mass, 33 (9.2%) patients had sinusitis, 29 (8.1%) patients had laryngeal cancer, 14 (3.9%) patients had tongue cancer, 2 (0.6%) patients had parapharyngeal mass and 31 (8.7%) patients had normal findings.

DISCUSSION

The findings of age distribution are similar to the cross sectional study by Bahrami et al done in 2010.[5] The team found out that the most common affected age group is between 30-39 years of age, followed by the 20-29 year age group but the most common cause of headache in this age group was primary headache rather than secondary. Also, sex distribution in this study is in accordance with the study on cervicogenic headache by Sjaastad et al in 2008 on 1838 subjects in Norway which included patients of age 18-65 years.[6] They observed that there was a male preponderance and the female male ratio was 0.7.

The observations of this study in addiction history are analogous to the head HUNT study by Ahmodt et al in 2006.[14] They found that prevalence rates for headache were higher amongst smokers as compared to non-smokers, mostly for patients under 40 years smoking more than 10 cigarettes per day (OR 1.5, 95% CI 1.3-1.6).

Similar studies about triggering factors of headache include the following:

Table 1: Scientific study and the observed triggering factor.

Study	Observed triggering factors
SAMS study[7]	Weather changes (83%)
	Seasonal changes (73%)
	Exposure to allergens (68%)
	Change in altitude (38%)
Wöber et al et al[8]	Weather changes (82.5%)
	Stress (66.7%)
	Menstruation (54.2%)
	Seasonal changes (71%)
	Exposure to allergens (63%)
Rozen et al[9]	Flu like illness (22%)
	Stressful event (9%)
	Surgical procedure (9%)
Finocchi et al[10]	Food (60%)
Gupta et al[11]	Loud sound (58%)

The nasal examination findings are in accordance with the findings of Peric et al which showed that patients with mucosal contact points like septal spur, concha bullosa and septal deviation who had no relief on medical therapy showed reduction in pain on VAS scale following corrective surgery.[12] It is already known that intracranial extension is a dreaded complication of chronic otitis media and headache comes in conjunction with that. However, in our study group, all patients underwent a CT scan and no intracranial complication was found in

patients with otomastoiditis. The pain may be due to activation of nociceptive fibres within the inflamed periosteum and otitis externa. Alyssa et al they reported a case of petrous apicitis that presented like migraine without aura which showed complete resolution of headache following treatment with antibiotics.[13]

Limitations

No surgical interventions were done on the patients to look for relief in headache following corrective surgery.

CONCLUSION

Young population is mostly affected with age group between 20 and 30 years. The duration of headache is more in low socioeconomic group and also, patients with severe headache is mostly seen in the low socioeconomic group. This may be due to the lack of access to medical facilities in this group. Addictions like smoking, alcoholism, paan and gutka chewing are associated with increased incidence and frequent episodes of headache. Symptomatic deviated nasal septum was the most common nasal pathology. So, surgical correction of mucosal contact points may provide relief to the patient. The most common ear pathology causing headache is otitis externa. Maintaining good hygiene practices can reduce the incidence of otitis externa and thereby, headache also. Computerized tomography is a valuable tool in diagnosing the underlying pathology causing headache. All patients with long duration headache must undergo a detailed physical and radiological investigation.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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