

Headache: An Out Patients Clinic Approach (Ophthalmological View)

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Abstract:

Purpose: The aims of this study were: (i) to estimate the prevalence of headache disorders in patients attending the eye OPD; (ii) to evaluate various causes of headache with special reference to ophthalmic condition; and (iii) to study the correlation between location of headache and possible ocular causes.

Method: An assessment of present complaints, with associated sign and symptoms, detail history, ophthalmological check up as external examination of the eyes, visual acuity, convergence test, slit lamp examination, refraction, direct ophthalmoscopy, perimetry and tonometry, was done.

Results: In this study, the male female ratio was 1:1.44, maximum numbers of patients with headache were observed in the age group 16-30 years (39.47%), majority of patients (86) were student by occupation (45.26%), 45.26% patients (86) had ophthalmological causes of headache. Maximum number of patients with headache (23) had uncorrected Hypermetropia/Presbyopia/Astigmatism (12.1%) (Mean age = 45.65 year).

Conclusion: Headache is multifactorial in origin. Possibility of ocular causes should be kept in mind during management of headache. An ophthalmologist may play a vital role in establishing the correct diagnosis of headache.

Keywords: Convergence test, direct ophthalmoscopy, headache, perimetry, refraction, tonometry, visual acuity

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I. Introduction

Headache is the symptom of pain anywhere in the region of the head or neck. It occurs in migraines (sharp or throbbing pains), tension-type headaches, and cluster headaches.^[1] Frequent headaches can affect relationships and employment.^[1] There is also an increased risk of depression in those with severe headaches.^[1] Headaches can occur as a result of many conditions whether serious or not. There are a number of different classification systems for headaches.

The well-recognized is that of the International Headache Society. Causes of headaches may include fatigue, sleep deprivation, stress, and the effects of medications, the effects of recreational drugs, viral infections, loud noises, common colds, head injury, rapid ingestion of a very cold food or beverage, and dental or sinus issues. Treatment of a headache depends on the underlying cause, but commonly involves pain medication. Some form of headache is one of the most commonly experienced of all physical discomforts. About half of adults have a headache in a given year.^[1] Tension headaches are the most common, affecting about 1.6 billion people (21.8% of the population) followed by migraine headaches which affect about 848 million (11.7%).^[2]

Causes:

There are more than two hundred types of headaches. Some are harmless and some are life-threatening.

Primary vs. secondary headache:

Headaches are broadly classified as "primary" or "secondary"^[3]

Primary headaches are benign, recurrent headaches not caused by underlying disease or structural problems. For example, migraine is a type of primary headache. While primary headaches may cause significant daily pain and disability, they are not dangerous. Secondary headaches are caused by an underlying disease, like an infection, head injury, vascular disorders, brain bleed or tumors. Secondary headaches can be harmless or dangerous. Certain "red flags" or warning signs indicate a secondary headache may be dangerous.^[4]

Primary headache: 90% of all headaches are primary headaches. Primary headaches usually first start when people are between 20 and 40 years old.^[5] The most common types of primary headaches are migraines and tension-type headaches.^[5] They have different characteristics. Migraines typically present with pulsing head pain, nausea, photophobia (sensitivity to light) and phonophobia (sensitivity to sound). Tension-type headaches usually present with non-pulsing "bandlike" pressure on both sides of the head, not accompanied by other symptoms.^[6] Other very rare types of primary headaches include:^[4]

- Cluster headaches: short episodes (15–180 minutes) of severe pain, usually around one eye, with autonomic symptoms (tearing, red eye, nasal congestion) which occur at the same time every day.
- Trigeminal neuralgia or occipital neuralgia: shooting face pain
- Hemicrania continua: continuous unilateral pain with episodes of severe pain. Hemicrania continua can be relieved by the medication indomethacin.
- Primary stabbing headache: recurrent episodes of stabbing "ice pick pain" or "jabs and jolts" for 1 second to several minutes without autonomic symptoms (tearing, red eye, nasal congestion). These headaches can be treated with indomethacin.
- Primary cough headache: starts suddenly and lasts for several minutes after coughing, sneezing or straining.
- Primary exertional headache: throbbing, pulsatile pain which starts during or after exercising, lasting for 5 minutes to 24 hours. It can be treated with medications such as indomethacin.
- Primary sex headache: dull, bilateral headache that starts during sexual activity and becomes much worse during orgasm.
- Hypnic headache:

Secondary headache:

Headaches may be caused by problems elsewhere in the head or neck. More serious causes of secondary headaches include.^[4]

Meningitis: inflammation of the meninges which presents with fever and meningismus, or stiff neck

Bleeding inside the brain (intracranial hemorrhage) Subarachnoid hemorrhage (acute, severe headache, stiff neck without fever) Ruptured aneurysm, arteriovenous malformation, intraparenchymal hemorrhage (headache only)

Brain tumor: dull headache, worse with exertion and change in position, accompanied by nausea and vomiting.

Temporal arteritis: inflammatory disease of arteries common in the elderly (average age 70) with fever, headache, weight loss and jaw claudication.

Acute closed angle glaucoma (increased pressure in the eyeball): headache that starts with eye pain, blurry vision, associated with nausea and vomiting.

Post-ictal headaches: Headaches that happen after a convulsion or other type of seizure, as part of the period after the seizure

Pathophysiology:

The brain itself is not sensitive to pain, because it lacks pain receptors. However, several areas of the head and neck do have pain receptors and can thus sense pain. These include the extracranial arteries, middle meningeal artery, large veins, venous sinuses, cranial and spinal nerves, head and neck muscles, the meninges, falx cerebri, parts of the brainstem, eyes, ears, teeth and lining of the mouth.^{[7][8]} Pial arteries, rather than pial veins are responsible for pain production.^[4] Headaches often result from traction to or irritation of the meninges and blood vessels. The nociceptors may be stimulated by head trauma or tumors and cause headaches. Blood vessel spasms, dilated blood vessels, inflammation or infection of meninges and muscular tension can also stimulate nociceptors and cause pain.^[8] Once stimulated, a nociceptor sends a message up the length of the nerve fiber to the nerve cells in the brain, signaling that a part of the body hurts.

Primary headaches are more difficult to understand than secondary headaches. The exact mechanisms which cause migraines, tension headaches and cluster headaches are not known. There have been different theories over time which attempt to explain what happens in the brain to cause these headaches. Migraines are currently thought to be caused by dysfunction of the nerves in the brain.^[9] Previously, migraines were thought to be caused by a primary problem with the blood vessels in the brain.^[10] This vascular theory, which was developed in the 20th century by Wolff, suggested that the aura in migraines is caused by constriction of intracranial vessels (vessels inside the brain), and the headache itself is caused by rebound dilation of extracranial vessels (vessels just outside the brain). Dilation of these extracranial blood vessels activates the pain receptors in the surrounding nerves, causing a headache. The vascular theory is no longer accepted.^{[9][11]} Studies have shown migraine head pain is not accompanied by extracranial vasodilation, but rather only has some mild intracranial vasodilation.^[12]

Currently, most specialists think migraines are due to a primary problem with the nerves in the brain.^[9] Aurals are thought to be caused by a wave of increased activity of neurons in the cerebral cortex (a part of the brain)

known as cortical spreading depression^[13] followed by a period of depressed activity.^[14] Some people think headaches are caused by the activation of sensory nerves which release peptides, such as serotonin, causing inflammation in arteries, dura and meninges and also cause some vasodilation. Triptans, medications which treat migraines, block serotonin receptors and constrict blood vessels.^[15]

People who are more susceptible to experience migraines without headache are those who have a family history of migraines, women, and women who are experiencing hormonal changes or are taking birth control pills or are prescribed hormone replacement therapy.^[16] Tension headaches are thought to be caused by activation of peripheral nerves in the head and neck muscles^[17] Cluster headaches involve over activation of the trigeminal nerve and hypothalamus in the brain, but the exact cause is unknown.^[18]

II. Material And Method

A total of 190 cases with headache, were included in this study conducted in the Department of Ophthalmology, Maharani Laxmi Bai Medical College, Jhansi, Uttar Pradesh, India over a period of 18 months from Dec. 2015 to May 2017. The procedures followed were in accordance with the ethical standards committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000. The necessary permission from the Ethical and Research Committee was obtained for the study.

A detailed clinical history was taken with emphasis on onset, duration, location, intensity, character, diurnal variation, and exaggerating and relieving factors. Occupation of each patient was also recorded. Cases of manifest squint were excluded. A comprehensive clinical examination including visual acuity of each eye for distance and near was conducted in all cases. Intraocular tension was taken with applanation tonometer and Humphrey visual field analysis were carried out to rule out any possibility of glaucoma. All the patients were then subjected to thorough dark room investigations. Cover test (screen test) for distance and for near were conducted to rule out latent squint. Ocular movements were tested uniocularly and binocularly. Retinoscopic examination was carried out under appropriate cycloplegia. A postmydriatic test was done after 3 days if retinoscopy had been done under homatropine and after 2 weeks if it had been done under atropine. Orthoptic evaluation included measurement of the near point of convergence and power of accommodation. Maddox rod test was used for the measurement of heterophoria for distance and Maddox Wing test was used for near point of conversion. Near point of convergence and amplitude of accommodation were recorded by Royal Air Force ruler. Range of fusion and power of ductions were tested on the synoptophore in each patient. Examinations of the media and fundi were carried out under mydriasis. Patients whose diagnosis remained inconclusive on eye examination were referred to other departments such as medical, ENT, dental, neurology, or psychiatry, as required, and elicited by history and investigation. Besides these checkups investigations such as hemoglobin, blood sugar, skull X-ray and paranasal sinuses, and CT scan of sinuses and brain were carried out where needed and treatment was advised accordingly

Inclusion criteria:

- Patients with headache, and no history any type of medication (either for headache or any other disorder).
- Both male and female patients were included in the study.
- The age group of the patients to be studied was between 5 to 75 years.

Exclusion criteria:

Patients classified in the following groups were not included in the study group:

- Patients with headache with known underlying causes, excluded from the study.
- Patients with headache already on medications, were not included in the study.
- Patients who had any systemic disease (known case of TB, DM, HTN, COPD, asthma, thyroid disorder, blood disorder, neurological disorder, and other chronic illness) were excluded from the study
- Patients who had history of any prolonged medication and history of any surgery (recent or past), were excluded from the study.
- Patients more than 75 year of age, were not included in the study.
- Patients with head injury (recent or past), excluded from the study.

III. Results

A total 190 patients of the age group 5-75years with headache were included in the study

Table 3.1 Gender ratio of patients (n=190)

	Male	Female
Number	77	112
Percentage	41.05%	58.95%

Table 3.1 shows gender distribution of the patients in the study group. There were 77 (41.05%) males and 112 (58.95%) females. The male female ratio was 1:1.44

Table 3.2 Age and sex wise distribution of patients (n=190)

Age groups (in years)	Male	Percentage	Female	%age	Total	Percentage
05-15	19	10.0%	09	4.74%	28	14.74%
16-30	26	8.95%	49	25.79%	75	39.47%
31-45	17	13.68%	28	14.74%	45	23.68%
46-60	09	4.74%	15	7.89%	24	12.63%
61-75	07	3.68%	11	5.79%	18	9.47%
Total	78	41.05%	112	58.95%	190	100

Out of 190 cases, maximum numbers of patients with headache were observed in the age group 16-30 years (39.47%) followed by 23.68% in 31-45 years. Most commonly 16-30 year age group of female (25.79%).

Table 3.3 Occupation of the patients having headache (n=190)

Occupation	No. of cases	Percentage (%)
Student	86	45.26%
Housewife	43	22.63%
Clerk	18	9.48%
Technical personnel	14	7.37%
Laborer and farmer	08	4.21%
Driver	06	3.16%
Others	15	7.9%
Total	190	100%

Table 3.3 describes that out of 190 patients with headache, majority of patients (86) were student by occupation (45.26%) followed by housewife 43 (22.63%).

Table 3.4 Mean age and various cause of headache (n=190)

Various causes of headache	Number of patients	Percentage	Mean age of patients (In years)
Inflammatory causes:			
Uveitis	06	3.16%	43.85
Herpes zoster ophthalmicus	02	1.05%	52.50
Optic neuritis	01	0.52%	46.00
Giant cell arteritis	00	00%	-----
Orbital cellulitis	02	1.05%	57.00
Corneal ulcer	07	3.68%	62.25
Endophthalmitis	05	2.63%	67.45
Refractive causes:			
Overcorrected myopia	04	2.11%	21.50
Uncorrected hypermetropia/presbyopia/ astigmatism	23	12.11%	40.65
Strabismus	08	4.21%	13.35
Convergence deficiency	13	6.84%	17.04
Vascular causes:			
Post. communicating artery aneurysm	01	0.52%	56.00
Ocular ischemic syndrome	00	00%	-----
Carotid-cavernous fistula	00	00%	-----
Dry eye syndrome			
	03	1.58%	36.40
Glaucoma:			
Acute congestive, open angle, close angle, phacomorphic, phacolytic	07	3.68%	52.47
Computer vision syndrome			
	04	2.11%	38.50
Total (n=190)	86	45.26%	

Table 3.4 Describe that, out of 190 patients, 86 patients (45.26%) had ophthalmological causes of headache. Maximum number of patients with headache (23) had uncorrected Hypermetropia/Presbyopia/Astigmatism (12.11%) (Mean age age=40.65 year) Followed by Convergence deficiency 6.84% (Mean age=17.04 year)

IV. Discussion

Presentation of patients with headache in optometry clinic is something usual and might be challenging to assess [19]. It causes about 21% of people with headache having consulted an eye care practitioner for advice [20]. These kinds of patients mostly attribute their headache to the visual disorders. However, findings of the current study indicated no significant difference in prevalence of various types of refractive errors between headache group and normal subjects. In the present study, the prevalence of total refractive errors was higher in headache group compared to normal subjects.

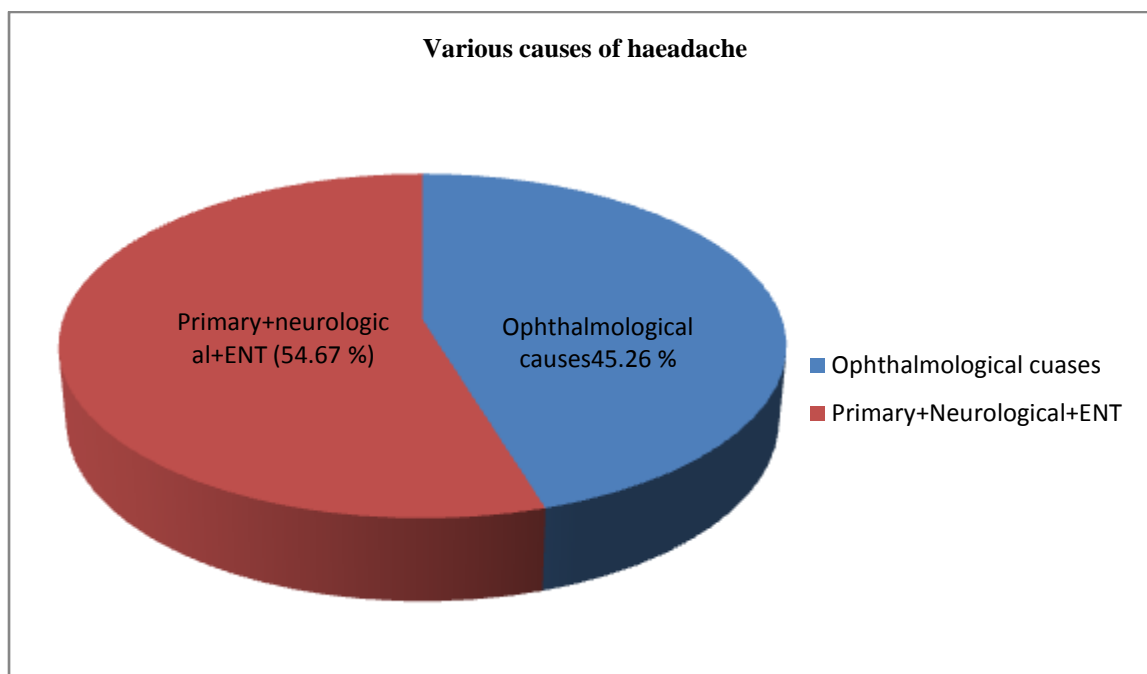
According to the International Headache Society (HIS), the criteria for the headache related to refractive errors include: (1) uncorrected refractive errors or mis correction of refractive errors; (2) mild pain in frontal lobe as well as in eyes; (3) pain that is relieved by resting but get worse by doing visual tasks at the distance or angle for a long time when visual acuity is impaired. However, it should be noted that the attribution of headache in visual problem is usually overestimated [21].

Age Incidence: In our study population, the maximum incidence of headache (i.e., 39.47%) was found in the age group of 16–30 years. In the age group of 31–45 years, the incidence was found to be 23.68%. The incidence was the lowest (i.e., 9.47%) in the age group of >60 years. Similar findings were reported by Dhir [22] and Ahmed and Zuberi [23] who found the maximum incidence of headache in the age group of 20–30 and 15–20 years, respectively

Sex Incidence: In our study, the incidence of headache was found to be higher in females (58.95 %) than in males (41.05%) in all age groups. Our findings are consistent with findings of Lanchner [24], Donahue, [25] and Dhir [22] who reported incidence of headache in females to be 58.3%, 56%, and 57% in their respective studies.

Various Causes of Headache: In our study, the headache due to ophthalmic causes was found in 45.26% cases, followed by primary headache, ENT, and other medical causes.

Refractive causes of Headache: In our study the main cause of ocular headache was refractive errors (55.81%)



V. Conclusion

Headache, which is one of the most common symptoms, may occur due to innumerable causes and sometime it is difficult to establish its mechanism in many cases. Proper headache management needs complete understanding of all agonies of patients. Sufficient time committed to a systematic headache history is the key to effective diagnosis and successful management. Ophthalmic disorders responsible of headache are many. An ophthalmologist has a vital role in the management of headache. A detailed clinical history and a multidisciplinary approach in a stepwise manner will greatly help in exploration of the cause of headache. It also provides an opportunity to establish a good doctor–patient rapport and decreases the burden of disorder rather than shunting patient from doctor to doctor

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