ORIGINAL ARTICLE

Aetiology of headache in clinical ophthalmic practice at a tertiary care hospital of Karachi

Uzma Fasih,[1] Arshad Shaikh,[2] Nisar Shaikh[3]

Abstract

Objective: To determine the aetiology of headache in patients seen for an ocular examination.

Methods: This cross-sectional, descriptive study was conducted at Ophthalmology Department of Karachi Medical and Dental College, Abbasi Shaheed Hospital, Karachi, from January to December 2014, and comprised patients with headache. Patients were registered through non-probability consecutive sampling technique. A predesigned proforma was used to collect data. Complete ocular examination and investigations were conducted along with neuro-ophthalmological examination. Data analysis was done using SPSS 16.

Results: Of the 379 patients, 225(59.4%) were female and 154(40.6%) were male. The mean age was 35.12±16.387 years (range: 6-75 years). Conditions associated with headache were divided as ocular, non-ocular and combined pathologies. Among ocular causes, asthenopia was a major entity as 62(16.36%) asthenopic patients presented with refractive errors. These were followed by presbyopics who presented with complaint of headache 56(14.78%). The number of computer users with similar complaint was 18(4.76%). Among other ocular causes of headache, the number of patients with corneal ulcers was 22(5.80%), glaucoma 15(3.96%) and endophthalmitis 4(1.06%). Among the non-ocular causes were hypertension 59(15.57%), sinusitis 41(10.82%) and migraine 47(12.4%).

Conclusion: The majority of patients had associate ocular causes such as refractive errors and anterior segment pathologies.

Keywords: Headache, Ocular causes, Non-ocular causes, Combined pathologies. (JPMA 67: 166; 2017)

Introduction

Headaches that present to an ophthalmologist include migraine, facial pain syndromes, and pain associated with cranial neuropathies, orbital and ocular disease. The most common definable headache syndromes are those designated as migraine, with a prevalence of 5-25% and a marked female preponderance.[1]

Due to a close link between the eyes and headaches, ophthalmologists are usually the first physicians to evaluate patients with headaches, eye pain and headache-associated visual disturbances. Many primary headache disorders have ophthalmic features, and secondary causes of headache frequently involve the visual system.

Some headaches are symptoms of medical emergencies, placing the ophthalmologist in the front line of their recognition and management. In addition, most of the cases of ophthalmic origin as refractive errors first present to neurologists and undergo unnecessary investigations leading to waste of time and money which could be avoided if an ophthalmologist is consulted initially.[1,2]

The current study was planned to determine the aetiology of headache in patients seen for an ocular examination in ophthalmology outpatient clinics.

Materials and Methods

The cross-sectional, descriptive study was conducted at the Ophthalmology Department of Karachi Medical and Dental College, Abbasi Shaheed Hospital, Karachi, from January to December 2014, and comprised patients with headache.

The sample size was calculated using OpenEpi sample size calculator (version 2.3) for demographic studies, taking confidence interval (CI) at 95%, estimated population size 100,000, margin of error 5% and hypothesised frequency (P) 44% refractive errors as the cause of headache.[3] There was no local and recent international relevant studies except the one we used.

All the patients presenting in the outpatient department with the complaint of headache were included.

Patients with any type of ocular trauma were excluded.

Patients were registered through non-probability consecutive sampling technique. A predesigned

[1,2]Eye Department, Karachi Medical & Dental College, Abbasi Shaheed Hospital, [3]Eye Department, Liaquat College of Medicine and Dentistry, Dar-u-Sehat Hospital, Karachi.

Correspondence: Uzma Fasih. Email: yousufuzma@hotmail.com

proforma was filled. An ocular examination which included measurement of visual acuity, refraction, slit lamp examination and fundoscopy was conducted. Other examinations such as measurement of intraocular pressure, neuro- ophthalmological examination, visual field and fundus fluorescein angiography were performed when needed. All the findings were recorded on the proforma.

Data analysis was done using SPSS 16. Descriptive statistics were used to calculate mean and standard deviation (SD) for age. Frequencies and percentages of ocular abnormalities and non-ocular causes of headache were calculated among patients who presented with headache for an ocular examination.

Results

Of the 379 patients, 225(59.4%) were female and 154(40.6%) were male. The overall mean age was 35.12±16.387 years (range: 6-75 years).

Table: Various Conditions Associated with Headache.

Ocular abnormalities	Frequency n(%)
Asthenopia	
1. Refractive Errors (astigmatism 65%	
hypermetropia 25% myopia 10%)	62(16.36%)
2. Prebyopia	56(14.78%)
3. Computer users	18(4.76%)
Other Causes	
4. Corneal Ulcer	22(5.80%)
5.Angle Closure Glaucoma	15(3.96%)
6. Endophthalmitis	4(1.06%)
7. Acute uveitis	4(1.06%)
8. Stye	3(0.79%)
9. Adenoviral Conjunctivitis	2(0.53%)
10. Papilloedema	2(0.53%)
11. Acute Dacryocystitis	2(0.53%)
12. Infected Chalazion	1(0.26%)
13. Inflammed Pterygium	1(0.26%)
14. Optic Neuritis	10.26%)
15. Orbital cellulitis	1(0.26%)
16. Vernal Catarrh	1(0.26%)
17. UGH Syndrome	1(0.26%)
Total	196(51.72%)
Non Ocular Abnormalities	**Frequency n(%)**
1.Hypertention	59(15.57%)
2.Migraine	47(12.40%)
3.Sinusitis	41(10.82%)
4.Tobbacco Addicts	10(2.64%)
5.Tuberculous Meningitis	4(1.06%)
6.Preeclepsia	2(0.53%)
Total	163(43.02%)
Ocular = Non Ocular Condition	**Frequency n(%)**
1.Refractive Errors +sinusitis	10(2.64%)
2.Refractive Errors +Migraine	10(2.64%)
Total	20(5.26

UGH: Uveitis-glaucoma-hyphema.

Conditions associated with headache were divided as ocular, non-ocular and combined pathologies. Among ocular causes, asthenopia (or eye strain) was a major entity as 62(16.36%) asthenopic patients presented with refractive errors. These were followed by 56(14.78%) presbyopics who presented with complaint of headache. Computer users with similar complaint were 18(4.76%).

Among other ocular causes of headache, the number of patients with corneal ulcers was 22(5.80%). Glaucoma was found in 15(3.96%) patients. Presentation of endophthalmitis and acute uveitis was 4(1.06%) each. There were 3(0.79%) patients with stye. There were 2(0.53%) patients each of adenoviral conjunctivitis and papilloedema. Besides, there was 1(0.26%) patient each with acute dacryocystits, infected chalazion, inflamed pterygium, optic neuritis, orbital cellulitis, vernal catarrh and uveitis-glaucoma-hyphema (UGH) syndrome.

Among the non-ocular causes, 59(15.57%) patients were hypertensive, 47(12.4%) presented with migraine, 41(10.82%) with sinusitis, 10(2.64%) were tobacco addicts, 4(1.06%) had tuberculous meningitis, and 2(0.53%) patients had pre-eclampsia. Moreover, there were 20(5.27%) patients with combined pathologies, including 10(2.64%) with refractive errors along with sinusitis and 10(2.64%) with refractive errors along with migraine (Table).

Discussion

Headache and ocular pain are frequent complaints in ophthalmic practice. Clinically, a clear distinction between headache, facial pain and eye pain is not always apparent, but when present, it helps in the diagnostic approach. Intraocular findings may be manifestations of both ocular and systemic pathology.

We conducted this study to find out the aetiology of headache among the patients who presented in outpatient department with complaint of headache.

Conditions associated with of headache were divided as ocular, non-ocular and combined pathologies. Among ocular causes, asthenopia, or eye strain, was a major entity. Maximum number of astheopic patients who presented with the complaint of headache had refractive errors 62(16.36%). There has been ongoing debate whether uncorrected refractive error causes asthenopia or eye strain. Untreated hyperopia can result in persistent attempts to accommodate, thus

relaxing accommodation with hyperopic prescription may lessen the eye discomfort. Accommodative spasm usually occurs in young patients and presents with eye pain, myopia and meiosis when doing near work.

A French study reported 44% patients with refractive errors who presented with headache.[3] A Nepalese study also reported forty-four percent patients with refractive errors among whom astigmatism was more frequent (63.63%) followed by hyperopia (27.27%) and myopia (9.09%).[4] In our study, refractive errors represented 16.4% of the total cases. This difference may be due to patient enrolment techniques as these studies excluded every headache with known cause. However, the presentation of astigmatism was 65%, hypermetropia 25% and myopia 10%, which is similar to the Nepalese study.

Gil Gouveia and Martins reported in their study that with adequate correction, 72.5% of the subjects with headache and refractive error reported improvement in their headache, and 38% had complete remission of headache. Regardless of the type of headache, the frequency of headache was significantly reduced in these patients.[5]

Another cause of asthenopia was presbyopia. The number of presbyopics with complaint of headache was 56(14.78%). Kaimbo et al. reported 11% patients of presbyopia in their study who presented with complaint of headache.[3] This figure is quite similar to that of our study. The number of computer users with similar complaint was 18(4.76%).

The prevalence of headache among computer users observed in another study was 13%.[4] The patho-physiology of headache associated with prolonged computer use resides within the ocular surface abnormalities, accommodative spasms and dry eyes.[6]

Asthenopia is said to be dull aching or boring pain, whether superficial or deep-seated, constant or intermittent, especially related to the use of eyes and aggravated by factors such as fatigue or poor illumination.[7] There is usually ocular discomfort with lids feeling hot and swollen. Vision may be blurred, particularly for near work. Frontal headache may develop. The key feature of asthenopia is that it is related to visual effort. The eyes appear normal but on examination may reveal refractive errors, accommodative fatigue, poor convergence or difficulty in controlling a latent squint. So before treating an obscure case of headache on general medical lines, possibility of asthenopia should be ruled out as it is one of the factors in its aetiology.[8]

The mechanism of headache associated with asthenopia is not fully understood but it is presumed to be on the basis of referred pain of visceral origin. So ciliary pain is referred to areas associated with cervical segments which connect with the superior cervical ganglion and the somatic outflow from which is represented by bulbospinal root of trigeminal and upper cervical nerves. As ophthalmic division of trigeminal nerve is represented most caudally, ciliary pain is primarily frontal and occipital in origin.[6]

Among other ocular causes of headache, patients with corneal ulcers were 22(5.80%). Glaucoma was found in 15(3.96%) patients. Presentation of endophthalmitis and acute uveitis was 4(1.06%) each. There were 3(0.79%) patients with stye, and 2(0.53%) each with adenoviral conjunctivitis and papilloedema. Kaimbo et al. reported 12% patients with anterior segment disease such as glaucoma and uveitis associated with headache.[3]

Any ocular inflammatory disease and acute rise in intraocular pressure may cause pain in and around the eye and also cause headache.[8] Acute elevation in intraocular pressure is usually associated with pain, while an eye with a similar pressure of gradual onset may be asymptomatic. While acute angle-closure glaucoma is the most common painful glaucoma, some forms of secondary open- and closed-angle glaucoma are associated with acute pressure spikes and pain.[9]

Papilloedema was reported in 2(0.53%) cases in our study and were diagnosed to be cases of benign intracranial hypertension. Papilloedema often warrants urgent neuroimaging to rule out tumour, hydrocephalus or bleeding.[10]

The headache of increased intracranial pressure need not be severe, but it is often present on awakening and associated with vomiting. The ophthalmologist should not consider this entity benign, as chronic papilloedema may lead to blindness. Headache from elevated blood pressure may also be accompanied by bilateral disk swelling.[10] In the current study, 1(0.26%) case of reterobulbar optic neuritis was also reported. Retrobulbar optic neuritis presents with subacute loss of vision and pain on eye movement with normal appearing optic nerves initially.[11] A few cases of stye, infected chalazion, pterygium and orbital cellulitis were also reported, which present with headache as an

associated symptom.

Among the non-ocular causes, hypertensive patients who reported with headache were 59(15.57%). Physiologic mechanisms that cause headache in acute and chronic hypertension are unclear. It has been reported that uncontrolled hypertension can increase frequency and severity of migraine attacks. In 1913, Janeway[12] drew attention towards association between headache and hypertension. Subsequently, large epidemiological studies showed no difference in prevalence of headache between hypertensive and non-hypertensive populations. Nevertheless, some clinical studies have reported that headache was more common among hypertensive patients, particularly those with severe and uncontrolled hypertension. In a survey of 22,685 Norwegian adults, Hegen et al. found that patients with systolic blood pressure greater than 150 mmHg had 30% lower risk of nonmigrainous headaches as compared to those with blood pressure less than 140 mmHg. Moreover, risk of nonmigrainous headaches decreased with increasing diastolic levels.[13]

Migraine was the cause of headache in 47(12.40%) patients. Migraine without aura, or common migraine, represents more than half of migraine headaches.[1] Migraine with aura, formerly called classic migraine, constitutes 10-35% of migraines and consists of aura, headache and post-headache period. The exact mechanism of the head pain which occurs during a migraine is unknown. Some evidence supports a primary role for central nervous system structures.[1,2]

Kaimbo et al. have reported 3.9% patients of migraine in their study who presented with headache and ocular symptoms.[3] Cluster headache (CH) is a neurological disorder characterised by recurrent, severe headache on one side of the head, typically around the eye.[14] No patient in our study reported with cluster headache. Sinusitis was reported in 41(10.82%) patients. A clinical study of headache in relation to sinusitis and its management by A. Kaur reported 28.9% patients with sinusitis who presented with headache. Patients with sinus headaches usually complain of pain and pressure sensation around the sinuses and peri-orbital areas.[15]

Tobacco addicts with headache were 10(2.64%). A study by Fredrick R. and Taylor M. reported tobacco exposure as a headache trigger.[16] Tuberculous meningitis was reported in 4(1.06%) patients. Ersoz M. et al. reported headache as the most commonly presenting symptom in 88% of their patients in a study conducted on tuberculous meningitis.[17] Besides, 2(0.53%) patients of pre-eclampsia were also reported. Headache may be considered a symptom of pre-eclampsia, a diagnostic feature of pre-eclampsia with severe features, a premonitory symptom of eclampsia, and an indication for delivery.[18] There were patients with combined pathologies as refractive errors along with sinusitis and refractive errors along with migraine 10(2.64%) each. So, careful evaluation is essential as a patient may have more than one cause of headache ocular as well non-ocular. Stress headaches were not diagnosed until all other causes were considered and ruled out. Moreover, it is not necessary that all headaches of ocular origin do present with a red eye. Patients of headache in association with stye, infected chalazion acute dacryocystitis, papilloedema and optic neuritis usually present with a white eye. On the other hand, headaches with combined pathologies like allergic sinusitis and allergic conjunctivitis do present with a red eye. All headaches with white eye excluding refractive errors do not indicate they have a neurological origin. They should be seen by an ophthalmologist to exclude an ocular cause and to avoid unnecessary and expensive neurological workup.

Conclusion

The majority of patients had associated ocular causes such as refractive errors and anterior segment pathologies. The most common cause of non-ocular headaches was hypertension, followed by migraine. They could be ruled by history and proper examination. Initial assessment by ophthalmologist may save time and expenditure on irrelevant investigations. Moreover, a detailed evaluation of patient with headache is necessary as there could be a combined pathology of ocular and non-ocular origin, which could be overlooked.

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