

Frequency of the Ophthalmological Disorders Associated with Headache

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Purpose: To determine the frequency of ophthalmological disorders associated with headache.

Study Design: Cross-sectional study.

Place and Duration of Study: This study was conducted in the outpatient department of Fatima Memorial Hospital from January 2018 to July 2018.

Material and Methods: The sample population was selected through non-probability, convenience sampling technique. A proforma was filled that included questions about the characteristics of headache and the ocular findings on examination. Complete eye examination was done by a consultant ophthalmologist. The various disorders related with headache were divided into the following categories that included ocular, non-ocular, combined ocular and combined ocular with non-ocular causes. Statistical analysis was done using SPSS version 23.

Results: Out of the 180 patients, 127 (70.6%) were females and 53 (29.4%) were males. The mean age was 25.02 ± 12.89 years ranging from 5 to 80 years. In the ocular causes, the most common were asthenopias present in 83 (46.11%) patients. These included 29 (16.1%) patients of convergence insufficiency, 18 (10%) patients with hypermetropia, 15 (8.3%) patients with myopia, 7 (3.9%) patients with presbyopia and 4 (2.2%) patients with increased mobile and computer usage. The patients who suffered from other ocular causes such as keratoconus and hypertensive retinopathy were 2 each (1.1%) and the number of patients presenting with acute uveitis, blepharitis, retinal detachment and squint were 1 each (0.6%). In the non-ocular causes, 61 (33.9%) patients presented with migraine.

Conclusion: Most of the patients with ocular causes had refractive errors and majority of the patients with non-ocular causes had migraine.

Keywords: Headache, Asthenopia, Refractive errors, Migraine.

Headache is one of the most common presenting complaint of patients but still it is not adequately treated¹. According to a study conducted to assess the global burden of headache, it was estimated that headache and accompanying presentations affect approximately half of the population of the world². To focus on this pandemic, leading organizations of the world

collaborated with the World Health Organization (WHO) to establish, 'Lifting the Burden: The Global Campaign to Reduce the Burden of Headache Worldwide'³. A cross-sectional study conducted to study the prevalence of headache in Pakistan proposed that Pakistan has a higher percentage of headache cases. It reported a prevalence of 76.6% in one year, which is noticeably above the global average

of 46%⁴. In a study conducted in eight countries, Vowels et al. concluded that headache was one of the most frequently reported pain in patients⁵.

The first physicians to evaluate the patients presenting with headache accompanied by visual disturbances are ophthalmologists. That being said, to make a definite diagnosis and to manage patients adequately it requires the ophthalmologist to have a thorough knowledge of headache disorders, a comprehensive history and a complete clinical examination⁶. A survey conducted on more than 250 ophthalmologists involved in training courses related to headache determined that around 50 patients consult an ophthalmologist with concerns related to headache in a month⁷. In a study conducted in France, the highest proportion of patients with headache consulting an ophthalmologist were 19.2% of the total⁸. Patients with headache consulting an ophthalmologist commonly have migraine, facial pain syndromes, cranial neuropathies with pain, ocular and orbital disease⁹. The most common disorder related to headache apparently is migraine, that has a significant female predominance with a prevalence of 5-25%⁹.

However, the frequency of ophthalmological disorders associated with a headache has not been clearly defined in literature. The relationship of age and gender to the frequency of ophthalmological disorders associated is still not clear. This study investigates the frequency of the ophthalmological disorders associated with headache and the relationship with age and gender.

MATERIAL AND METHODS

This cross-sectional descriptive study was conducted in outpatient department of Fatima Memorial Hospital from January 2018 to July 2018. The sample population was selected through non-probability, convenience sampling technique. All the patients with headache presenting in other departments were referred to the eye department if it was vision related or originated in the eye.

All patients who presented in the outpatient department and those who were referred from other departments were included in our study. There was no age limit set for patients to be included in our study. Patients who had a history of ocular trauma were not included in the study. Patients who had psychiatric illnesses were also not included in our study.

The sample size was calculated by taking a prevalence of 36% from a study done in India¹⁰, to be 180 by taking confidence interval at 95%, power of the study at 80% and alpha at 7% using the formula:

$$n = \frac{z_{1-\alpha/2}^2 P(1 - p)}{d^2}$$

The disorders related with headache were divided into Ocular, Non-ocular, combined ocular and combined ocular with non-ocular causes.

The data was collected on a proforma with parameters including the characteristics of pain and the findings on ocular examination. These characteristics of pain included onset, duration, time since headache, dominant head region involved and the radiation of the headache. On ocular examination, multiple diseases and conditions were diagnosed (Table 1). This clinical examination of the patient with headache comprised of the evaluation of visual acuity by snellen chart, refraction and if required specialized assessment for intraocular pressure by goldmann appplanation tonometry and visual field by perimetry performed by a consultant ophthalmologist.

Data analysis was done using SPSS version 23. The frequency of the ophthalmological disorders associated with headache was recorded.

RESULTS

Of the 180 patients, 127 (70.6%) were females and 53 (29.4%) were males. This shows that there is predominance of females in the patients presenting in the outpatient department with headache. The mean age was 25.02 ± 12.89 years ranging from 5 to 80 years. The details are shown in Table 1.

Table 1: Frequency of Various Disorders Related to Headache.

Ocular Causes	Number	Percentage
Asthenopia	83	46.11
Anisometropia	1	.6
Astigmatism	9	5.0
Convergence Insufficiency	29	16.1
Hypermetropia	18	10.0
Mobile and Computer Usage	4	2.2
Myopia	15	8.3
Presbyopia	7	3.9
Other Ocular Causes	9	5
Acute Uveitis	1	.6
Blepharitis	1	.6

Hypertensive Retinopathy	2	1.1
Keratoconus	2	1.1
Retrobulbar Optic Neuritis	1	.6
Retinal Detachment	1	.6
Squint	1	.6
Non-Ocular Causes	71	39.44
Frontal Sinusitis	4	2.2
Epilepsy	1	.6
Migraine	61	33.9
Stress Headache	5	2.8
Ocular and Non-Ocular Abnormalities Combined	14	7.78
Migraine and Astigmatism	5	2.8
Migraine and Convergence	8	4.4
Migraine and Myopia	1	.6
Combined Ocular (More than one ocular cause)	3	1.67
Astigmatism and Convergence	2	1.1
Astigmatism and Hypermetropia	1	.6
Total	180	100.0

DISCUSSION

Headache and ocular pain are the persistent complaints of patients in ophthalmic practice. A study conducted in India concluded that the highest proportion of patients (36%) that presented with headache had an underlying ophthalmic cause¹⁰. The percentage of females (70.6%) in our study was reasonably greater than (29.4%) males. An Indian study reported that the percentage of females (53.55%) was higher compared to males that was (43.55%)¹⁰. Another study conducted in Nepal in 2012 also determined that the patients who presented with headache due to ophthalmic cause had female predominance¹¹. Headache is more prevalent in females due to emotional variability and stress in a society dominated by males.

The major entity in the ocular disorders was asthenopia. The highest proportion of patients who presented with headache had refractive errors, 72 (40%). Our results were quite similar to a study conducted in France that reported refractive errors in 44% of the patients who had headache¹². Another study conducted in Nepal also reported that 44% of patients who presented with headache in ophthalmology department had refractive error. Convergence insufficiency was found in 29 (16.1%) of the patients. Convergence insufficiency is quite common in the general population with a reported incidence of 2 to 17%¹³. Work done by Dusek et al demonstrated that patients who had difficulty in reading with no underlying intellectual or psychological problem may be due to convergence

insufficiency¹⁴. Presbyopia is another cause of asthenopia. In our study 7 (3.9%) of the patients had presbyopia. A study conducted in 2017 estimated that around 1.09 billion people are suffering from functional presbyopia¹⁵, from which around 26 million people have near vision impairment as they were not properly treated¹⁶. However, in a study conducted by Kaimbo et al. the proportion of patients was 11% that was much higher than our study¹². The number of patients with headache due to the use of mobile and computer were 4 (2.2%). In another study conducted in Pakistan the reported cases with headache due to mobile and computer usage were 4.76%¹⁷. Their results were quite similar to our study. The mechanism behind headache due to prolonged usage of computer is due to the dry eyes, abnormalities of the surface of the eye and accommodative spasms¹⁸. An important feature of asthenopia is its relation to the visual effort so when treating an incomprehensible case of headache as general medical patient, the likelihood that patient might have asthenopia should always be kept in mind¹⁸. The patients with other ocular causes such as keratoconus and hypertensive retinopathy were 2 (1.1%) each and the number of patients presenting with acute uveitis, blepharitis, retinal detachment and squint were 1 (0.6%) each. In our study 1 (0.6%) patient of retrobulbar optic neuritis was seen. In another study conducted in Pakistan in 2017, retrobulbar optic neuritis was seen in 0.26% of the patients¹⁷. Patients suffering from retrobulbar optic neuritis present with a normal optic disc in the initial course of the disease with symptoms of loss of vision and pain during extra-ocular movements¹⁹. Proper follow-up of the patients having retrobulbar optic neuritis should be done as there is likelihood that the patient might have remission of the disease, particularly if they have multiple sclerosis²⁰.

Among the non-ocular causes migraine was present in 61 (33.9%) of the patients. Migraine without symptoms of aura is present in more than half of the patients with migraine headaches. Migraine with symptoms of aura, previously called the classic migraine, is established in 10-35% of the migraine headaches. Classic migraine consists of symptoms of aura, headache and post-headache period. The precise pathophysiology of the headache during migraine is not clearly defined in literature. Some studies have supported the notion that the structures of the central nervous system play an important role in mechanism of headache in migraine patients^{9,21}. A French study reported that 3.9% of the patients had migraine which

is very low as compared to our study¹². Work done by Bolay et al. determined that females had a greater predisposition towards migraine²². Patients presented with combined ocular and non-ocular causes included 8 patients (4.4%) with migraine and convergence insufficiency, 5 (2.8%) with migraine and astigmatism and 1 (0.6%) presented with migraine and myopia.

So the management of patient with headache presenting in the ophthalmology department requires a great deal of conjecture from the clinician caring for such patients as the patient might suffer from ocular, non-ocular and combined causes. The diagnosis of stress headache was not made in the patients until other possible causes were ruled out. Furthermore, it is not a norm that patients with headache originating from the eye should have a red eye. Patients with ocular disorders such as stye, optic neuritis, papilloedema, acute dacryocystitis and infected chalazion have a white eye. On the contrary, patients having allergic rhino-conjunctivitis present with a red eye. Headaches with white eye on ocular examination excluding refractive errors do not point towards a neurological cause of headache. A majority of cases of headache that are of ophthalmic origin such as errors of refraction mostly present to neurologists and have to undertake needless investigations that lead to waste of money and time of the patient²¹. So headache with visual symptoms should be evaluated by an ophthalmologist, prior to expensive diagnostic work up to rule out a possible neurological cause. Ophthalmologists are considered to be competent in treating headache²³.

The limitation of our study was that it was conducted in one hospital. More studies are required to produce generalizable results.

CONCLUSION

The majority of patients who had associated ocular causes had refractive errors whereas the most common cause of headache associated with non-ocular causes was migraine. They could be diagnosed by taking a proper history and conducting a thorough ocular examination. Furthermore, proper evaluation of a person with headache should be done as there could be a combined ocular and non-ocular origin of the headache that could be missed.

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Conceived and designed the research, assessed the cases and wrote the paper.

Dr. Syed Abdullah Mazhar
Collected the data, did the literature search, drafted the manuscript and assisted in writing the paper.

Dr. Nazish Ali
Analyzed the data and revised the manuscript.

Dr. Ahsan Zil-E-Ali
Revised the original manuscript and assisted in writing the paper.

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