

TO IDENTIFY THE OPHTHALMIC FACTORS CONTRIBUTING TO HEADACHES AMONG PATIENTS SEEKING MEDICAL CARE AT A TERTIARY HEALTHCARE FACILITY

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Abstract

Background: The occurrence of headache is widely prevalent among the human population. There exists a prevalent societal belief that advocates for the universal adoption of ophthalmic examinations as a means to address headaches among individuals. **Aim:** The objective of this study is to identify the ophthalmic factors contributing to headaches among patients seeking medical care at a tertiary healthcare facility. **Materials and Methods:** A cross-sectional study was conducted at the Department of Ophthalmology Outpatient Department (OPD) in a tertiary care hospital. This study encompassed all individuals who sought medical attention for headache at our department. **Results:** The ocular causes of headache accounted for 34.48% of the total proportion. The prevalence of headache related to ocular causes is higher among students, with approximately 80 individuals (40%) reporting such symptoms. This is followed by housewives, with approximately 65 individuals (32.5%) experiencing similar headaches. The prevalence of frontal headache is higher, accounting for 66% (n=132) of the observed cases. Patients who have a final correction of less than 1 diopter are more likely to experience headaches compared to those with higher corrective powers. This study demonstrates that 133 individuals, accounting for 66.5% of the total sample, exhibit a statistically significant relationship. Astigmatism, with a prevalence of 72 (36%), represents the predominant ocular aetiology associated with headache. The second most prevalent cause is hypermetropia, observed in 59 cases, accounting for 29.5% of the total. This is followed by presbyopia, which accounts for 40 cases, or 20% of the total. **Conclusion:** The occurrence of headaches resulting from ocular issues is highly prevalent. When managing a case of headache, it is important to consider ocular causes. The examination of patients experiencing headaches is necessary in order to eliminate the possibility of ocular disorders, particularly refractive errors and binocular vision anomalies.

INTRODUCTION

The occurrence of headaches is a prevalent symptom. Headache is the term used to describe pain that is situated above the orbitomeatal line. While frequently voiced, this concern is frequently subject to misdiagnosis and insufficient treatment. The differential diagnosis of headache is extensive and encompasses a wide range of potential underlying conditions. Headaches can be broadly categorised into two main types: primary headaches and secondary headaches.^[1-3] Primary headaches are a type of headache that is characterised by its benign

nature and recurrent occurrence, without being attributed to any underlying disease or structural abnormalities. In contrast, secondary headaches arise due to an underlying pathological condition such as infection, cranial trauma, vascular abnormalities, or neoplastic growths. The brain itself does not possess pain receptors, rendering it insensitive to pain. However, various regions within the head and neck possess pain receptors, enabling the sensation of pain in these areas. Numerous primary headache disorders exhibit ophthalmic characteristics, while secondary causes of headache often encompass the visual system. Owing to the strong association between ocular conditions and

headaches, ophthalmologists typically serve as the primary medical professionals responsible for assessing patients presenting with headache symptoms. Numerous ophthalmological factors contribute to the occurrence of headaches, including refractive errors, computer vision syndrome, convergence insufficiency, uveitis, keratitis, glaucoma, and inflammations of the lid and lachrymal sac, among others.^[4,5] The primary aim of this study is to assess the ophthalmic factors contributing to headaches among patients seeking care at an ophthalmology outpatient department in a tertiary healthcare facility.

MATERIALS AND METHODS

A cross-sectional study was conducted at the Department of Ophthalmology Outpatient Department (OPD) in a tertiary care hospital. This study encompassed all individuals who sought medical attention for headache at our department. This study excluded individuals with non-ocular aetiologies, patients who were severely ill and debilitated, as well as pregnant women.

Methodology

All patients who presented with a headache to the Department of Ophthalmology underwent examination. Those individuals who were found to have ocular causes for their headache were invited to participate in the study. Prior to enrollment, the study requirements were explained to the patients in a language that they could comprehend, and written informed consent was obtained. The enrolled subjects underwent clinical evaluation. Visual acuity was assessed from a distance of 6 metres using either Snellen's chart or E chart. Subsequently, all the individuals within the study cohort underwent slit lamp examination, followed by the acquisition of autorefractometry readings. Furthermore, the

patients' pupils were dilated using tropicamide eye drops. Following the process of dilatation, a thorough examination of the fundus was conducted, which was subsequently followed by wet retinoscopy. Upon completion of these procedures, acceptance was granted. The patients were requested to schedule a follow-up appointment after a period of three days in order to undergo post mydriatic testing. Additionally, any necessary corrections were administered during this follow-up visit. Following the observation of fundus findings, specific patients underwent intraocular pressure (IOP) measurement and gonioscopic examination. In several instances, the diagnosis was confirmed through the utilisation of CT scans and other pertinent investigations. Patients experiencing headaches due to non-ocular factors were appropriately referred to departments specialising in medicine, psychiatry, or other relevant disciplines.

Statistical Analysis

The collected data was inputted into an Excel spreadsheet. The descriptive statistical analysis involved the calculation of the mean and standard deviation for quantitative variables, and the determination of frequency and percentages for categorical variables. The relationship between categorical variables was examined through the utilisation of the Chi-square test. The data underwent analysis through the utilisation of SPSS statistical software version 25.0.

RESULTS

During the course of our study, a total of 5800 patients exhibited symptoms of headache. Approximately 200 cases were identified as having ocular causes. The ocular causes of headache accounted for 34.48% of the total proportion.

Table 1: Demographic profile of the patients

Gender	Number	Percentage
Male	59	29.5
Female	141	70.5
Age		
below 20	17	8.5
20-30	90	45
30-40	58	29
Above 40	37	18.5
Mean Age	34.58±4.58	
Occupation		
Students	80	40
Housewife	65	32.5
Farmer	20	10
Clerk, Tailor	9	4.5
Technical Personnel	7	3.5
Others	19	9.5

Among the cohort of 200 individuals presenting with ophthalmic-related headaches, it was observed that 90 patients (45%) fell within the age range of 20-30 years, while 58 patients (29%) were classified within the age range of 30-40 years. Females exhibit a higher prevalence of headaches. The present study consisted of a sample of 200 participants, comprising 141 females (70.5%) and 59 males (29.5%). The prevalence of headache related to ocular causes is higher among students, with approximately 80 individuals (40%) reporting such symptoms. This is followed by housewives, with approximately 65 individuals (32.5%) experiencing similar headaches.

Table 2: Headache and its characteristics

	Number	Percentage
Head ache Duration		
Acute	21	10.5
Sub-acute	51	25.5
Chronic	128	64
Headache Region		
Frontal	132	66
Occipital	23	11.5
Combined	45	22.5
Final Correction		
O D	11	5.5
< 1 D	133	66.5
1.25 - 2 D	43	21.5
> 2 D	13	6.5

The condition of experiencing persistent and recurring headaches over an extended period of time. The prevalence of 128 (64%) is higher compared to the acute and sub-acute types. The prevalence of frontal headache is higher, accounting for 66% (n=132) of the observed cases. Patients who have a final correction of less than 1 diopter are more likely to experience headaches compared to those with higher corrective powers. This study demonstrates that 133 individuals, accounting for 66.5% of the total sample, exhibit a statistically significant relationship.

Table 3: Ophthalmic causes of headache

	Number	Percentage
Diagnosis		
Astigmatism	72	36
Hypermetropia	59	29.5
Presbyopia	40	20
Others	29	14.5
Type of Astigmatism		
Myopia	1	0.5
Simple Myopic	80	40
Compound Myopic	20	10
Simple Hypermetropic	7	3.5
Mixed	92	46

Astigmatism, with a prevalence of 72 (36%), represents the predominant ocular aetiology associated with headache. The second most prevalent cause is hypermetropia, observed in 59 cases, accounting for 29.5% of the total. This is followed by presbyopia, which accounts for 40 cases, or 20% of the total. An additional factor contributes to 29 cases, representing 14.5% of the total. The primary ocular factor contributing to headaches is refractive errors, with astigmatism being the most prevalent, followed by hypermetropia, presbyopia, and other factors such as glaucoma, papilloedema, and strabismus. Among patients with astigmatism who reported experiencing headaches, a majority of 92 individuals (46%) exhibited a mixed type of astigmatism, while a significant proportion of 80 cases (40%) displayed a simple myopic type of astigmatism.

DISCUSSION

In the present investigation, it was determined that the ocular aetiology accounted for 34.48% of reported cases of headache. In a study conducted by Shashi Jain, it was reported that ocular headache was observed in 36% of the patients.^[6] In the examined cohort, a total of 200 individuals presenting with headaches of ophthalmic origin were included. Among these patients, 90 individuals (45%) fell within the age range of 20-30 years, while 58 individuals (29%) were classified within the age range of 30-40 years. According to the study conducted by Shashi Jain, the highest occurrence was observed in individuals aged between 15 and 30 years, accounting for 46.8% of the total cases. Dhir and Ahmed, as well as Zuberi, reported comparable results indicating that the highest prevalence of

headaches was observed among individuals aged 20-30 years and 15-20 years, respectively.^[6-8]

Headache among individuals within this specific age cohort may arise as a result of psychological stress induced by educational demands for professional advancement, occupational stressors, emotional influences, and familial discord. In the present investigation, it was observed that the prevalence of headache exhibited a greater occurrence among females (70.5%) as compared to males (29.5%) across all age cohorts. The aforementioned studies conducted by Shashi Jain, Lanchner, Donahue, and Dhir have also yielded comparable results, with reported rates of headache occurrence in females ranging from 56% to 58.3%.^[6-10] Marasini et al. [11] also documented a greater prevalence of headaches among females. The elevated prevalence of headaches among females may be attributed to

factors such as increased emotional instability, hormonal fluctuations, and psychological stress. In our study, it was observed that headache associated with ocular causes was more prevalent among students, accounting for approximately 40% (n=80) of the sample. This was followed by housewives, with a prevalence rate of 32.5% (n=65). In their respective studies, Shashi Jain, Brown, and Kronfeld also observed comparable findings, with 52% and 60% of the student population experiencing headaches.^[6,12] Headache in individuals within this particular age demographic may potentially arise as a result of the environmental conditions present within both the home and school settings, wherein the prevailing expectations for academic achievement may exert significant stress and strain.^[11] In our study, it was observed that chronic headache, accounting for 128 cases (64%), exhibited a higher prevalence compared to the acute and sub-acute types. The prevalence of frontal headache is higher, accounting for 66% (n=132) of the observed cases. In a study conducted by Shashi Jain, it was found that 67.7% of patients experienced anterior headache. In their study, Marisani et al.^[11] also documented that frontal headache was observed in 49% of the cases. The pain experienced in the ciliary region is primarily of frontal origin, as it is associated with the ophthalmic division of the trigeminal nerve, which is located in the most caudal region. According to our research findings, it has been determined that astigmatism, specifically accounting for 72 cases or 36% of the total, represents the predominant ocular factor contributing to headaches. The second most prevalent cause is hypermetropia, observed in 59 cases, accounting for 29.5% of the total. This is followed by presbyopia, which accounts for 40 cases, or 20% of the total. An additional factor contributes to 29 cases, representing 14.5% of the total. Shashi Jain.^[6] also reported similar findings. According to Fasih, it was also found that 14.78% of individuals with presbyopia experienced headaches (citation). Dhir also observed that muscle imbalance, particularly exophoria, was found to have a greater significance in the aetiology of headaches. The maintenance of binocularity and parallelism is facilitated by the extraocular muscles, which are regulated by the process of fusion. When there is a muscle imbalance, the extraocular muscles experience increased strain. These muscles are abundantly supplied with nerve endings that are sensitive to pain. As a result, this strain can lead to ocular asthenopia (eye fatigue) and headaches.^[14] Papilledema was observed in 2 cases, accounting for 0.53% of the total sample, as reported in the study conducted by Uzma Fasih.^[13] Papilledema frequently necessitates prompt neuroimaging in order to exclude potential aetiologies such as tumours, hydrocephalus, or haemorrhage.^[15] The present study revealed that astigmatism was the prevailing refractive error, accounting for 72 cases (36%), while hypermetropia was the second most

frequent, observed in 59 cases (29.5%). According to the findings of Shashi Jain, it was observed that astigmatism (42.37%) is the prevailing refractive error leading to headaches, followed by hypermetropia (21.46%) [6]. In their study, Ahmed and Zuberi (year) observed the presence of astigmatism in 59% and hypermetropia in 11% of patients experiencing headaches.^[16] Marasini's study revealed that astigmatism was observed in 63.63% of cases, hypermetropia in 27.27% of cases, and myopia in 9.09% of cases.^[11] Patwardhan and Sharma.^[17] also asserted the presence of a similar pattern regarding the prevalence of refractive errors among individuals experiencing headaches. The occurrence of headaches resulting from the contraction of ciliary muscles in hypermetropia, whether of equal or varying degrees, is attributed to the patient's need to accommodate in order to achieve clear vision. Similarly, in cases of astigmatism, particularly of low or moderate severity, irregular contractions of the ciliary muscles may lead to more intense headaches.^[6] In the conducted study, it was observed that 66.5% of the patients exhibited a refractive error of less than 1 Dioptre, while 21.5% of the patients fell within the range of 1.25 to 2 Dioptre. Shashi Jain, a researcher at Griffith University, made similar observations and emphasised that minor astigmatism errors were associated with more pronounced ocular asthenopia [6,18]. Cogan further documented that minor refractive abnormalities, specifically hypermetropia and astigmatism, have been associated with the occurrence of headaches.^[19] The study findings are deemed statistically significant with a p-value of less than 0.001. One possible explanation for the increased prevalence of headaches in individuals with hypermetropic astigmatism and mixed astigmatism could be attributed to the involuntary and prolonged exertion of excessive accommodative efforts, which places strain on the eyes. In our study, it was observed that a mixed type of astigmatism was present in 92 patients, accounting for 46% of the total sample. Following this, a simple myopic type of astigmatism was identified in 80 cases, representing 40% of the overall cohort. In their study, Shashi Jain reported that the prevailing form of astigmatism was simple hypermetropic astigmatism, accounting for 16% of cases, followed by simple myopic astigmatism, which accounted for 14.5% of cases.

CONCLUSION

The occurrence of headaches resulting from ocular issues is highly prevalent. When managing a case of headache, it is important to consider ocular causes. The examination of patients experiencing headaches is necessary in order to eliminate the possibility of ocular disorders, particularly refractive errors and binocular vision anomalies. It is imperative to prioritise comprehensive evaluation and

consultation with a suitable specialist when managing a patient presenting with a headache.

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