



ASSOCIATION OF HEADACHE WITH UNDER-CORRECTED REFRACTIVE ERRORS AND DISPENSING ERROR

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ABSTRACT

Background: Headache and refractive errors are very common conditions in the general population, and those with headache often attribute their pain to a visual problem. Dispensing error also causes headache in population & most of the population is unaware. **Objective:** To find out the frequency of under corrected refractive errors and dispensing errors in patients presenting with headache. **Material and Methods:** This is a cross sectional study done in LRBT Hospital Lahore and at various optical shops located in different towns. A Performa based interview of the study population was conducted. Frequency distribution/percentages of data were prescribed, cross tables, bar chart and pie chart were formed to calculate the statistical data. **Results:** Out of the 87 participants 30(34.48%) were males, and 57(65.51%) were females. Out of 87 participants 25(28.7%) had no pain, 42(48.3%) had moderate pain, and 20(23.0%) patients had worst pain. Out of the 87 participants 14(16.1%) had headache from 1 week, 14(16.1%) had headache from 2 weeks, while 17(19.5%) had headache from 3 weeks, and 19(21.8%) patients had headache from more than 4 weeks. Out of 87 participants 10(11.5%) were emmetropic, 4(4.6%) were hypermetropic, 59(67.8%) were myopic and 14(16.1%) patients were having astigmatism. Patients of headache due to under-corrected refractive errors were 48(55.2%), and patients with headache due to dispensing errors were 39(44.8%). **Conclusions:** In my study I concluded that dispensing and under corrected refractive errors are most common causes of headache but people are not aware of dispensing errors. Almost 48 (55.2%) were having headache due to under-corrected refractive error and 39 (44.8%) were having headache due to dispensing error.

KEYWORDS: Under-corrected Refractive errors, Dispensing errors, Headache.

INTRODUCTION

Headache has been defined as the pain which is mostly present above the orbito-meatal line.^[1] It is one of the most frequent reasons to seek a consultation with ophthalmologists and health care worker.^[2] Specific eye diseases associated with ocular pain or headache. It is difficult to diagnose the actual cause. Without the correct view of etiology it is impossible to diagnose and treat the headache.^[3]

The global burden of Disease Study 2010 (GBD2010) has placed headache disorder among the top ten causes of disability worldwide. Headache is often associated with significant drop in quality of life, absenteeism from school among children.^[4] Considering the high prevalence and negative impact on life, headache is currently considered as health problem all over the world.^[5] The associations found between habitual RE and

headache complaints indicate that habitual RE might be a risk factor for headache in children.^[6]

Headache associated with refractive errors was the only headache type significantly more common in peoples with refractive errors than in uncorrected refractive errors (6.7% versus 0%).^[7] The prevalence of refractive error in general populations estimated to be from 13 to 80% based on geographic area and age group.^[8] The incidence of sporadic headache and chronic primary headaches was 40 and 15% in developed countries.^[9] URE is the leading cause of vision impairment (VI) and the second leading cause of blindness.^[10] Vision impairment due to URE have been observed to have extensive social and economic impact, for example, limiting educational and employment opportunities of economically active persons, healthy individuals, and communities. Smith et al. indicated that the global

economy loses \$269 billion annually as a result of lost productivity due to URE.^[11]

From the year 2000, a series of studies using a survey methodology, referred to as Refractive Error Study in Children (RESC), were performed in populations with different ethnic origins and cultural settings: a rural district in eastern Nepal^[12]; a semi-rural county outside of Beijing, China^[13]; an urban area of Santiago, Chile^[14]; an urban and a semi-rural area of KwaZulu-Natal, South Africa^[15]; a rural district near Hyderabad, India^[8]; and an urban area of New Delhi, India.^[16] These studies utilized data on presenting vision and confirmed the need for RE correction for children.

Uncorrected refractive error (URE) for distance vision, including under-corrected refractive error in more economically developed countries, has recently been highlighted as the main cause of low vision globally and the second leading cause of blindness after cataract.^[17] The uncorrected refractive error is associated with frontal and occipital headache.^[7] Eye strain is a direct cause of headache. When a careful eye examination and possible correction is done then the incidence of headache is reduced.^[18] It is suggested that minor refractive error caused severe headache and eyestrain than high refractive error. Ciliary muscle spasm has also been suggested as possible cause of headache.^[19]

Uncorrected refractive errors in children have a considerable impact on their physical and mental development. Patients with headache are referred to ophthalmologists and optometrists. Proper refractive correction can improve headache in over 70% related to refractive error.^[20]

Dispensing errors are characterized as discrepancy between a prescription and manufacturing of spectacles that opticians deliver to the patient on the basis of prescription.

Dispensing errors includes wrong IPD, wrong frame PD, Wrong Axis marking, De-centration of the lens, errors in BVD, Pentascopic tilt, In Bifocals the error of segment height, In Progressives the error of prism reference point, Wrong choice of Lens thickness and lens diameter.

MATERIALS AND METHODS

It was a cross-sectional observational study, conducted at Ophthalmology Department of LRBT Lahore for 4 months. The sample size of 87 participants was calculated with 95% confidence interval and 5% margin of error with an expected population of 38.38%. A sample size of 87 was used in this study.

Non-probability convenience sampling technique was used for this study.

Inclusion Criteria

Both male and female, Patient having complaint of

headache, Age between 15 to 30 years and no systemic disease and other ocular pathology.

Exclusion Criteria

Traumatic Eyes, Any other ocular pathology and any other systemic disease.

DATA COLLECTION PROCEDURE

Data was collected by clinical examination and self-designed Performa. After taking the consent of the patient visual acuity were recorded by using snellen chart. Patient with complaint of headache were evaluated by using Snellen chart at 6 m. Auto refraction, subjective refraction was performed to evaluate the refractive error and Slit lamp examination was done to rule out any other ocular cause of headache. For assessment of dispensing error, in optical shop IPD, frame PD, Axis marking, De-centration of the lens, errors in BVD, Pantascopic tilt, In Bifocals the error of segment height, In Progressives the error of prism reference point, Wrong choice of Lens thickness and lens diameter was evaluated thoroughly.

DATA ANALYSIS PROCEDURE

Data was entered and analyzed by using SPSS Statistical package of social science) version 20.00. All quantitative variables like Age, and Visual acuity was represented in mean \pm SD form. All qualitative variables like Gender, Headache, duration, intensity, Origin, headache association was represented by frequency or percentage form. Pie chart and bar chart was used to represent data.

RESULTS

Out of the 87 participants 30(34.48%) were males, and 57(65.51%) were females. Out of 87 participants 13(14.9%) had 6/6 vision, 14(16.1%) had 6/9, 10(11.5%) had 6/12, 7(11.5%) had 6/18, 16(18.4%) had 6/24, 9(10.3%) had 6/36, 12(13.8%) had 6/60, and 6(6.9%) participants had counting finger to there right eye. Out of the 87 participants 18(20.7%) had normal eye sight, 10(11.5%) had 6/9 vision, 13(14.9%) had 6/12, 2(2.3%) had 6/18, 15(17.2%) had 6/24, 10(11.5%) had 6/36, 13(14.9%) had 6/60, and 6(6.9%) participants had counting finger to their left eye. out of 87 participants 10 were 6/6 and had no headache, 34 had headache due to under-corrected refractive error in right eye in which 5 had mild pain, 19 had moderate pain, and 10 have worst pain. 43 had headache due to under-corrected refractive error in left eye in which 10 had mild pain, 23 had moderate pain, 10 had severe pain. Out of 87 participants 43 had dispensing error in right eye causing headache, 34 had dispensing error in left eye and 10 had normal vision but had headache due to dispensing error.

Out of 87 participants 25(28.7%) had no pain, 42(48.3%) had moderate pain, and 20(23.0%) patients had worst pain. Out of the 87 participants 14(16.1%) had headache from 1 week, 14(16.1%) had headache from 2 weeks, while 17(19.5%) had headache from 3 weeks, and 19(21.8%) patients had headache from more than 4 weeks. Out of 87 participants 10(11.5%) had empetropic,

4(4.6%) had hypermetropic, 59(67.8%) had myopic, and 14(16.1%) patients had astigmatism. Out of 87 participants 42(48.3%) had good convergence, and 45(51.7%) had poor convergence. Out of 87 participants 43 (49.9%) had dispensing error in right eye, 34 (39.1%) had dispensing error in left eye. Patients due to refractive causes were 48(55.2%), and patients with dispensing error cause of headache were 39(44.8%).

Out of 87 participants 10 were 6/6 and had no pain, 34 had headache due to under-corrected refractive error in

right eye in which 5 had mild pain, 19 had moderate pain, and 10 have worst pain. 43 had headache due to under-corrected refractive error in left eye in which 10 had mild pain, 23 had moderate pain, 10 severe pain. Out of 87 participants 10 were 6/6 and had no pain, 34 had headache due to under-corrected refractive error in right eye in which 5 had mild pain, 19 had moderate pain, and 10 have worst pain. 43 had headache due to under-corrected refractive error in left eye in which 10 had mild pain, 23 had moderate pain, 10 severe pain.

Under-Corrected Refractive Error * Intensity of headache Cross-tabulation.

Under-corrected RE	Mild	Moderate	Severe	No. of Pts.
Right eye	5	19	10	34
Left eye	10	23	10	43
Emmetropia	10	0	0	10
Total				87

Interpretation

Table no 5.3 shows that out of 87 participants 10 were 6/6 and had no pain, 34 had headache due to under-corrected refractive error in right eye in which 5 had mild

pain, 19 had moderate pain, and 10 have worst pain. 43 had headache due to under-corrected refractive error in left eye in which 10 had mild pain, 23 had moderate pain, 10 severe pain.

Dispensing Error * Intensity of Headache

Dispensing Error	Mild	Moderate	Severe	No. of Pts.
Right eye	11	16	16	43
Left eye	9	22	3	34
Emmetropia	5	4	1	10
Total				87

Interpretation

Out of 87 participants 43 had dispensing error in right eye causing headache, 34 had dispensing error in left eye and 10 had normal vision but had headache due to dispensing error.

headache were (10)13.5% and (30)40.54%, respectively, which shows a little difference from my study results.^[21]

Overall prevalence of dispensing error headache in my study turned out to be 44.8%.

DISCUSSION

Presentation of patients with headache in optometry clinic is something usual and might be challenging to assess. It causes about 21% of people with headache having consulted an eye care practitioner for advice. These kind of patients mostly attribute their headache to the visual disorders.

Sanjay Marasini, Jyoti Khadka et al. Conducted a study in 2012. In their study 44% patients reported with refractive headache and 56% patients having non refractive causes of headache which is comparable to the findings of our study.^[22]

In this study I took 87 patients with complaint of headache. The mean age of the patients was 21.33±3.06 years. These patients were examined to determine the correlation between headache and refractive errors & as well as dispensing errors. Out of these 87 patients having headache, 10(11.5%) had empetropic, 4(4.6%) had hypermetropic, 59(67.8%) had myopic, and 14(16.1%) patients had astigmatism.

George J.C.JinMD, PhD Alan S.CrandallMD Jason J.JonesMD conducted a study in 2007 To evaluate patients who had intra-ocular lens (IOL) exchange for unexpected postoperative refractive errors, determine the sources associated with the errors, and derive an empiric approach to estimating the power for IOL exchange.^[23]

Fereshteh Abolbashari, Seyed Mahdi Ahmadi conducted a study in 2014. In their study (20)27.02% myopic patients were having headache and (14)18.9% emmetropic patients reported with headache, which is similar to the results of our study. Whereas the hyperopic and astigmatic patients who were complaining for

Ruben C. M. conducted study in 1961 to evaluate the reason of headache in spectacle wears. It is well known by ophthalmologists and opticians that many "headache" subjects eventually obtain small correction glass. They are most happy with such corrections, but in many instances they are wearing optically incorrect spectacles. These patients would also be helped by any other visible, tangible aid offered to them, and a low-correction spectacle even when not optically necessary is the least evil of many of the modern treatments given to these

individuals.^[24]

Held HH. Conducted a study in 1959 on some problems in spectacle fitting. He said there is close relationship between consulting and dispensing aspects of optometry. If an optometrist handle spectacle fitting and dispensing by himself then chances of the patient still having symptoms later on is far less than if a second person handle the fitting.^[25]

Arsen Akinci MD, Alev Güven MD, Aydan Degerliyurt MD, Esin Kibar MD, Murad Mutlu MD, Mehmet Citirik MD, conducted study in 2008 to correlate the under-corrected refractive error with headache. Compound and mixed types of astigmatism, anisometropia, and mis-correction of refractive error were found more often in patients with headache than in control subjects.^[26]

CONCLUSION

In this study I concluded that majority of young patients having headache had a refractive origin but around 55% of the patients having headache had under corrected refractive causes and 51% having dispensing error, which should be assessed by ophthalmologist, physician, and optician to find the cause of headache and treat this commonly occurring problem in our generation, which is sometimes so debilitating that it hampers a person's day to day activities. Considering the high prevalence and negative impact on life, headache is currently considered as health problem all over the world.

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