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Original Research Paper

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THE PREVALENCE OF REFRACTIVE ERRORS IN PATIENTS PRESENTING WITH HEADACHE

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ABSTRACT

BACKGROUND: Headache is defined as the pain located above orbitomeatal line. Most of the people attribute their headache to ocular problem, despite this strong popular belief there is no definite indication that refractive errors is a cause of chronic headaches. In this context, the present study was conducted to study the prevalence of refractive errors as the cause of headache.

AIM: The aim of this study was to document the prevalence of refractive errors in patients with headache of unknown origin and to compare it with that of headache-free controls.

METHODOLOGY: The present prospective cross sectional study was conducted in the Department of Ophthalmology at Government Medical College and Hospital, Rajouri. A total of 155 patients with headache and 421 were included in control group. Detailed ocular assessment was done on all patients. The prevalence of the refractive errors, anisometropia, and previous miscorrection of refractive errors in patients with headache were compared patients with headache were compared with controls. A p value of <0.05 was regarded as statistically significant.

RESULTS: There were 82 females and 73 males in the headache group(Group A) and 221 females and 200 males in the control group(Group B).The relative risk of astigmatism was significantly higher in Group A (Odd'ratio = 2.75; 95% CI: 1.89-3.99)with so significant difference in other types of refractive error between two groups. The prevalence of miscorrection was 16.19% and 3.08% in the headache and the control groups, respectively. The prevalence of anisometropia was significantly more ($p=0.0004$) in Group A 23.8% than 2.37% in Group B.

CONCLUSION: Thus as a result of our study we concluded that astigmatism, anisometropia, and miscorrected refractive error are more frequently noticed in patients with headache than in control subjects.

KEYWORDS : Refractive errors, anisometropia, astigmatism, myopia,headache.

INTRODUCTION

Headache is defined as the pain located above orbitomeatal line.[1] The Global Burden of Disease Study 2010 (GBD2010) has sited headache amongst the top ten reasons of disability worldwide. Specific ocular ailments, such as acute congestive glaucoma, corneal ulcer, uveitis, and optic neuritis are identified to be related with ocular pain or headache.[1,2] Most of the people attribute their headache to ocular problem, despite this strong popular belief there is no definite indication that refractive errors is a cause of chronic headaches. Regardless of this, an ophthalmologist is the third most frequently consulted expert for headaches of recent onset.[3] Headache associated with refractive errors(HARE) has been defined in the International Headache Society's classification system[4] (IHS) as a separate category with the following diagnostic criteria:

1. Uncorrected or miscorrected refractive errors (e.g. myopia, hypermetropia, astigmatism, wearing of incorrect glasses).
2. Mild headaches in the frontal region and in the eyes themselves.
3. Pain absent on awakening, and intensified by prolonged visual tasks.

The evidence proposes a strong relationship between headache and refractive errors with astigmatism precisely.[5-8] A low grade astigmatism has been considered the most common cause of ocular headaches in young people.[9-11] In patients with low grade astigmatism, the increased efforts of accommodation to obtain distinct vision leads to a considerable strain on the eyeball thus leading to asthenopic symptoms, with headache being the most common symptom.[12] A symptomatic relief in asthenopia is noticed following correction of refractive errors [13]thus offering strength to the association between refractive errors and headache. Even though there is a widespread belief of causative effect of refractive errors on headache yet there is no fixed evidence that refractive errors alone can be a cause of chronic headaches.[14] In this context, the present study was conducted to study the prevalence of refractive errors as the cause of headache and to enumerate the minimum extent of refractive error which can be accountable for the symptomatic exhibition of headache and to assess the influence of refractive correction on the symptomatic relief of headache. The purpose of this study was to document the prevalence of refractive errors in patients with headache of unknown origin and to compare it with that of headache-free controls.

METHODOLOGY

The present prospective cross sectional study was conducted in the Department of Ophthalmology at Government Medical College and Hospital, Rajouri. The study included patients presenting with headache as the only complaint after giving informed consent and exclusive of those patients having any known illness which may contribute to headache. A total of 155 patients presenting with headache of unknown origin (GROUP A) and 421 patients who were headache free were included in control group (GROUP B) . Headache described by the patients fit two of the three diagnostic criteria for headache associated with refractive errors described in the International Headache Society's classification system.[4] The control group consisted of children, aged between 7 and 17 years. The demographic data including age, sex, residential address, occupation were noted. Detailed ocular assessment was done on all patients. Visual acuity both uncorrected and best corrected visual acuity with and without pin hole was noted using Snellen's charts. Autorefraction, with cyclopentolate eye drops for the patients under 10 years of age, and slit lamp biomicroscopy was performed. Dilated fundus examination was performed in all patients in the headache group. Myopia was defined as the spherical equivalent refraction of at least -0.50 D, hyperopia as the spherical equivalent refraction of atleast +2.0 D, astigmatism as the cylinder of at least 1.0 D, and anisometropia as the

spherical equivalent difference of at least 2.0D between the two eyes of the same child. Myopia was classified into mild (-0.50 to -3.0 D), moderate (-3.0 to -6.0 D), and severe (>-6.0 D) subgroups. Patients with bilateral myopia were classified according to the more myopic eye. Hyperopia was classified into mild (+2.0 to +4.0 D), moderate (+4.0 to +6.0D), and severe (>+6.0 D) subgroups. Simple astigmatism was defined as the condition in which one of the two principal meridians of an eye is either myopic or hyperopic. Compound astigmatism was defined as the condition in which the two principal meridians of an eye are either myopic or hyperopic. Mixed astigmatism was defined as the condition in which one meridian is hyperopic, while the one at a right angle to it is myopic. Astigmatism was classified into mild (1.0 to 3.0 D),moderate (3.0 to 6.0 D), and severe (>6.0 D) subgroups.

Ocular alignment was assessed by Hirschberg and alternating cover tests. The prevalence of the refractive errors, anisometropia, and previous miscorrection of refractive errors in patients with headache were compared with controls. Estimated odds ratio and 95% confidence intervals were computed to compare the relative risk of the groups for categorical variables. Student's t-test was used to compare the continuous variables. A p value of <0.05 was regarded as statistically significant.

RESULTS:

There were 82 females and 73 males in the headache group(Group A) and 221 females and 200 males in the control group(Group B). Mean age in Group A was 12.9 ±2.2 years, with range 8 to 18 years, in the Group B mean age was 13.4± 2.9 years with a range 7 to 17years. There was no statistically significant difference between the ages of two groups (p=0.076).The prevalence of refractive errors was higher in patients with headache(Group A) than in Group B (p = 0.003). There was no significant difference in myopia and hyperopia between two Groups but astigmatism was more common in Group A than Group B. The relative risk of astigmatism was significantly higher in Group A (Odd'ratio = 2.75; 95% CI: 1.89-3.99) with so significant difference in other types of refractive error between two groups. The prevalence of refractive errors, anisometropia, and previous miscorrection between the Group A and group B has been mentioned in Table no. 1. The prevalence of anisometropia was significantly more (p=0.0004) in Group A 23.8% than 2.37% in Group B. The prevalence of miscorrection was 16.19% and 3.08% in the headache and the control groups, respectively. Miscorrection was significantly more common in patients with headache(Group A) than in controls ,Group B(p = 0.0002) The relative risk of miscorrection of refractive error was significantly higher in Group A with Odd's ratio = 9.97; 95% CI: 5.63-12.6 (Table 1).

Table No.1
Pravelence Of Refractive Errors,previous Miscorrections And Anisometropia In Group A And Group B

	GROUP A(N=105)	GROUP B(N=421)	P VALUE
MYOPIA	07 (6.67%)	29(6.88%)	0.69
HYPERMETROPIA	08 (7.62%)	32(7.60%)	0.72
ASTIGMATISM	26 (24.76%)	33(7.83%)	<0.0001
ANISOMETROPIA	25 (23.81%)	10(2.37%)	0.0004
MISCORRECTED REFRACTED ERROR	17 (16.19%)	13(3.08%)	0.0002

P value < 0.05 is taken as statistically significant value.

DISCUSSION

This study reported that the prevalence of refractive errors is significantly higher in patients with headache of unknown origin than in headache-free controls with astigmatism being significantly higher in patients with headache and myopia ,hypermetropia being similar in both the groups. In addition to these results, anisometropia and miscorrected refractive error was also more common in the headache group. The limitation of this study was the lack of follow-up and failure to know if correction of refractive errors made a difference in the prevalence of headaches.

There are numerous studies evaluating the relationship between headache and refractive error but is still hard to be certain that whether refractive errors can cause headaches. It has been reported that lower degrees of refractive error, especially astigmatism may be related with headache.[16,17]Cameron[18] in his study examined 50 with headache out of which 18 were diagnosed to be suffering from migraine and 27 from tension headache with the remaining five patients being relieved by wearing optic correction.

In a study by Gil-Gouveia and Martins[19] evaluated 105 individuals with uncorrected refractive errors and a control group of 71 subjects with appropriately corrected or without refractive errors about their headache history. They linked the occurrence of headache in both groups and evaluated its relation to their ways of visual effort and type of refractive errors. They described that headache frequency was similar in both subjects and controls. Headache associated with uncorrected refractive errors was the only headache type significantly more common in subjects with refractive errors than in controls (6.7% vs 0%). It was associated with hyperopia but was unrelated to visual effort or to the severity of refractive error; 72.5% of their subjects with headache and refractive error reported improvement in their headaches, and 38% had complete remission of headache, with adequate correction. Regardless of the type of headache present, headache frequency was significantly reduced in these subjects.

In a recent study conducted by Hendricks et al[20] showed that refractive error might be a risk factor for headache in children. They evaluated the refractive status of 487 children, aged between 11 and 13 years, in a cross-sectional study by using a questionnaire about the headache and found that headache has a statistically significant association with the sphere factor of refractive error in cases of girls and the cylinder factor of refractive error in boys Thus as a result of our study we concluded that astigmatism, anisometropia, and miscorrected refractive error are more frequently noticed in patients with headache than in control subjects.

CONCLUSION:

In our study, headache shows a statistically significant association with refractive errors especially astigmatism. This correlation signifies that refractive error may be a risk factor for headache and appropriate correction of refractive error will lead to early relief of symptoms and thus improving the quality of life.

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