

CORRELATION BETWEEN MIGRAINE & REFRACTIVE ERRORS IN YOUNG POPULATION

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ABSTRACT: One of the major public health problems is headache. To evaluate refractive errors we can compare subjects with migraine headache with healthy subjects. Retinoscopy and subjective refraction can be done to find out anisometropia and type of refractive errors; myopia, hypermetropia and astigmatism. The incidences of sporadic headache, chronic primary headache are the causes for chief complaints from patients. Obviously the young adults contribute a vital role in economic and social aspects of the society, so headaches causes less work efficiency and personal too. Acute glaucoma, optic neuritis has been found to be responsible to be linked with headache. It was also reported the higher prevalence of headache in subjects with binocular vision anomalies and uncorrected refractive errors, not all the studies consistent with this theory. The criteria for the migraine connected with refractive errors include: (1) uncorrected refractive errors or wrongly corrected refractive errors; (2) mild pain in eyes and frontal lobe; (3) pain that is relieved by resting but get worse by doing visual tasks at the distance or angle for a long time when visual acuity is impaired.

Purpose: To compare the prevalence of refractive errors in the young adults with headaches

INTRODUCTION:

Headaches and refractive errors are common health problems in general population. 13 to 80% was the prevalence of refractive errors (RE) in the general population, and it was reported to be from based on variety of areas and age groups [1–3]. Besides, the incidence of sporadic headache was 40% and chronic primary headaches were 15% in developed countries [4]. As a consequence of this, headaches are a chief complaint. Worldwide variations of myopia in children also show similar differences across countries and regions as shown from the results of the Refractive Error Study in Children [25].

Obviously the young adults contribute a vital role in economic and social aspects of the society. So migraines that impact their work efficiency and their personal life might genuinely affect the society. The criteria for the migraine connected with refractive errors include: (1) uncorrected refractive errors or wrongly corrected refractive errors; (2) mild pain in eyes and frontal lobe; (3) pain that is relieved by resting but get worse by doing visual tasks at the distance or angle for a long time when visual acuity is impaired. In

India, the prevalence appeared to decrease from rural to urban children whereas, among urban children in China, the prevalence of myopia varied from 5.7% in 5-year-old to 30.1% in 10-year-old to 78.4% in 15-year-old people [26,27]. Also There were not any previous publications regarding the types and presentations of refractive errors in other countries like Yemen and neighboring countries. Previous studies reported a decrease in myopia and an increase in hyperopia with increasing age [28,29,30,31].

Acute glaucoma, optic neuritis has been responsible to be linked with headache [5]. But, some other studies reported the higher prevalence of headache in subjects with binocular vision anomalies and uncorrected refractive errors, not all the studies consistent with this theory [6,7].

According to the International Headache Society (HIS), the criteria for the migraine connected with refractive errors include: (1) uncorrected refractive errors or wrongly corrected refractive errors; (2) mild pain in eyes and frontal lobe; (3) pain that is relieved by resting but get worse by doing visual tasks at the distance or angle for a long time when visual acuity is impaired. However, it should be noted that the attribution of headache in visual problem is usually overestimated [8].

High prevalence of the headache, its serious consequences and ambiguous role of refractive errors in headache occurrence led us to compare the prevalence of RE in the young adults with headache complaints and a control group.

Migraine Types

Migraines are of different types. Most common are migraines with aura AKA a classic migraine) and migraine without aura (or common migraine).

Other types include:

Silent migraine: It is also known as acephalgic migraine. We can have aura symptoms without a headache.

Vestibular migraine: We have balancing problems, vertigo, nausea, and vomiting, with or without a headache. People with history of motion sickness usually have this.

Abdominal migraine: Not much known about this by the experts. It causes stomach pain, nausea, and vomiting. Occurs often in in children and with time might change into classic migraine headaches.

Hemiplegic migraine: When we have weakness on one side of your body or a short period of paralysis (hemiplegia). Numbness, dizziness, or vision changes can also be felt. Getting medical attention as soon as possible is necessary as these symptoms can also be signs of a stroke.

Ophthalmic migraine: This type is also known to us as an ocular or retinal migraine. It causes short-lived, partial, or total loss of vision in one eye, along with a dull ache behind the eye, which may spread to the rest of your head. Get medical help right away if you have any vision changes.

Migraine with brainstem aura: Dizziness, confusion, or loss of balance can happen before the headache. The pain may affect the back of your head. These symptoms usually start suddenly and can come along with trouble speaking, ringing in your ears, and vomiting. This type of migraine is strongly linked to hormone changes and mainly affects young adult women. Again, get these symptoms checked out by a doctor right away.

Status migrainosus: This severe type of migraine can last more than 72 hours. The pain and nausea are so intense that you may need to go to the hospital. Sometimes, medicines or medication withdrawal can cause them.

Ophthalmoplegic migraine: This causes pain around your eye, including paralysis of the muscles around it. This is a medical emergency because the symptoms can also be caused by pressure on the nerves behind the eye or by an aneurysm. Other symptoms include a droopy eyelid, double vision, or other vision changes.

EXCLUSION CRITERIA:

Suppression, neurological or internal diseases that cause headache, migraine headache, binocular visual anomalies and ocular diseases identified by the HIS as a cause of ocular pain or headache.

The following parameters were noted for all participants: refractive errors, **NPA** and **NPC**.

DISCUSSION:

Presentation of patients with headache in optometry clinic is something usual and might be challenging to assess [11]. About 21% of people with headache having consulted an eye care practitioner for advice [12]. These kinds of patients mostly attribute their headache to the visual disorders. Often symptoms of asthenopia are considered as a poor marker of ocular changes especially in young children[20]. However,

findings of the current study indicated no significant difference in prevalence of various types of refractive errors between the two groups.

In the present study, the prevalence of total refractive errors was higher in headache group compared to normal subjects, however, the difference between 2 groups was insignificant that was in contrary with previous reports. Akinci et al. [13] evaluated 310 subjects with headache (mean age 13.4 ± 2.6 years) and 843 control subjects (mean age 13.9 ± 3.1 years). These researchers used the autorefractometer in combination with cycloplegia (cycloplegia for the subjects under 10 years old). Although the amount of their myopia and hyperopia did not reach the significant level between groups, their headache group presented with higher rate of astigmatism.

Changes in astigmatism of the eye from the infants to adolescents have been documented in previous studies [14]. From the infancy to young adulthood there is a gradual change in astigmatism from against the rule toward with the rule. It is believed that with-the-rule astigmatism is less symptomatic in comparison with against-the rule astigmatism. In a previous [13] study the higher risk of headache in subjects with astigmatism was explained to be confined to this fact that in school ages, astigmatism presented in against-the-rule form, while in young adults (our study) with-the-rule astigmatism reported to be more prevalent.

Most of the studies in literature try to evaluate association of headache especially among young adults and children with refractive errors [21-24].

In our study 27.02% of the subjects in headache group and 28.20% in normal group presented with myopia. This range of refractive errors in both our groups was fairly typical of the age group [16]. Of our total myopic participants, only 31% were in headache group that was a lower percentage in comparison with subjects with hyperopia (45%) and astigmatism (40%). So this could be concluded that myopia patients might encounter with lower headache complaints in comparison with other types of refractive errors. Furthermore, eye practitioners should more carefully consider other factors (that cause headache problems) in history taking, examinations and referral process of patients with myopia.

The prevalence of hyperopia was twice in the headache compared to normal group but the difference did not reach the statistical level. This might indicate the role of ciliary muscle contraction and accommodation effort in hyperopic subjects that results in higher rate of headache complaints [17]. Eyebrow furrowing, prolonged contraction in muscles of the brow, neck and scalp for maintenance of a clear image is another possible mechanism that leads to headache [18]. In contrary, although the aforementioned study population were children [13], they showed lower incidence of hyperopia in their headache group compared to our

study. One explanation could be the use of autorefractometer for determination of refractive error in their study that resulted in underestimation of the hyperopia.

Regarding the severity of refractive errors, it should be noted that our subjects were mild and moderate myopia, mild hyperopia and astigmatism. The mean myopia, hyperopia and cylindrical power were -2.65 ± 1.70 D, 0.56 ± 0.07 D and 0.45 ± 0.53 D in headache group and -1.61 ± 1.36 D, 0.45 ± 0.74 D and 0.39 ± 0.27 D in without headache group ; Nevertheless, the differences were not statistically significant. Therefore, there were no subjects with moderate and severe hyperopia and severe myopia so further investigation is needed.

The value of NPC was in normal range for both groups [19]. On the other hand, there was higher value of NPC in headache group compared to control group. It could be proposed that even if the subject with headache has normal NPC, orthoptic exercises designed to improve the convergence could be helpful and may alleviate the pain. Considering the prevalence of headache, only if a few number of patients require these kinds of exercises, the number of those who might benefit from optometric intervention is significant.

Conclusion:

Based on our findings in this study, it is concluded that the prevalence of various types of refractive errors (myopia, hyperopia and astigmatism) in headache group is not significantly different from normal subjects. In addition, although the NPC in both studied groups was normal, orthoptic exercises that improve the convergence might be beneficial in patients with headache complaints. Historical literature is certainly correct that where anisometropia and low degrees of astigmatism are relatable in migraine. Our most significant finding was of higher degrees of astigmatism in the migraine group. This study does indicate that people who experience migraine headaches should attend their optometrist regularly to ensure that their refractive errors are appropriately corrected[20].

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