

# Treatment of Latent Hypermetropia in Adults Presenting with Chronic Headaches

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## Abstract

*Purpose:* To evaluate the response of the treatment of uncorrected latent hypermetropia in adults with chronic headaches. *Methods:* It's a prospective descriptive study. 50 subjects of age group 18-40 yrs with headache are evaluated using cycloplegic retinoscopy to estimate the latent hypermetropia. Other identifiable causes of headache are ruled out. With appropriate spectacle correction responses are evaluated at 1 month, 2 months, and 6 months on a 6 point patient satisfaction scale. *Results:* 55% were satisfied at 1 month, 75% at 2 months and 81% at 6 months. Among the age category 93.9% patients less than 30 yrs were satisfied at the end of 6 months and 74.6% were satisfied in more than 30 yrs age group. *Conclusion:* This study showed that age groups 18-40 yrs who presented with recurrent headache with no secondary cause were benefitted with latent hypermetropia correction. Thus this study emphasizes on the importance of cycloplegic retinoscopy and latent hypermetropia correction for young adults complaining of headache.

**Keywords:** Latent Hypermetropia; Manifest hypermetropia; Accommodation.

## Introduction

Significant hyperopia is defined as any degree of hyperopia sufficient to cause symptoms prompting clinical attention [1]. Hyperopia may be classified by structure and/or function of the eye. Simple hyperopia is due to decreased axial length or decreased converging power of cornea, lens, and/or media (flattened cornea/decreased curvature, increased thickness of lens, etc. [1]. Pathologic hyperopia is due to atypical development, trauma, or disease of the eye (i.e. cataract, microphthalmia, nanophthalmia, aniridia, etc.) [1,2]. Functional hyperopia is due to paralysis of accommodation [1,3]. If affected, functional hyperopia is usually present at birth. Drugs, such as cycloplegics, can also cause a transient hyperopia [1].

Hyperopia may also be categorized by the degree of refractive error: Low hyperopia is +2.00D or less, Moderate hyperopia ranges from +2.25 to +5.00D, and High hyperopia is +5.25D or more [1].

Hyperopia may also be classified by the role of accommodation to visual functioning. Facultative

hyperopia is hyperopia that can be overcome by accommodation whereas Absolute [9] hyperopia cannot be overcome by accommodation. Total hyperopia is the sum of Facultative and Absolute hyperopia [1].

Hyperopia may also be categorized based upon the outcome of noncycloplegic and cycloplegic refractions. Manifest hyperopia is determined with noncycloplegic refraction whereas Latent hyperopia is determined with cycloplegic refraction. The magnitude of hyperopia is the sum of Manifest and Latent hyperopia [1].

The Multi-Ethnic Pediatric Eye Disease Study Group reports hyperopia prevalence of children in each ethnic group of the sample population as being 26.9% of Hispanics, 25% of non-Hispanic White Americans, 20.8% of African Americans, and 13% of

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Asian Americans [8,9]. Hyperopia is most common in the Hispanic population, next most common in Native Americans, African Americans, and Pacific Islanders, and least most common in Asians and Caucasians. Most commonly, the patient may experience decreased visual acuity or asthenopia symptoms. Active accommodation mitigates some or all of hyperopia's adverse effects on vision. The impact of accommodation is highly dependent upon age, the amount of hyperopia and astigmatism, the status of the accommodative and vergence systems, and the demands placed upon the visual system. Accommodation typically enables younger patients to overcome facultative and latent hyperopia [1,2].

When the level of hyperopia is too great or the accommodative reserves are insufficient, due to age or fatigue, accommodative dysfunction may result as the eye is no longer capable of accommodating to focus light onto the retina [2] causing blurred vision and asthenopia develops. Asthenopia (eye strain) and/or eye pain is commonly reported and is associated with headaches due to close work such as reading, writing, or computer work [1,2]. Presbyopia brings an increase in absolute hyperopia, causing blur, especially at near. Binocular dysfunction is also a symptom of hyperopia [1].

Many persons between the ages of 10 and 40 years who have low hyperopia require no correction of their latent hyperopia, because they have no symptoms. Ample accommodative reserves shelter them from visual problems related to their latent hyperopia. Under increased visual stress, such persons may develop symptoms that require correction, of their latent hyperopia as well under cycloplegic refraction.

Facultative hyperopia can no longer be sustained comfortably, due to decreasing accommodative amplitudes. Latent hyperopia should be suspected when symptoms occur in conjunction with a lower-than-expected amplitude of accommodation for the patient's age. Cycloplegic retinoscopy can help identify this latent component. When persons reach their mid-thirties, accommodation takes noticeably longer, while facility decreases, causing associated vision problems in many hyperopic persons previously free of symptoms.

A prescription for the distance manifest (noncycloplegic) refraction for the patient to wear as needed (i.e., part time) often suffices. With increasing age and visual demands at near, the patient may require additional correction. Before prescribing a permanent pair of spectacles, the optometrist may lend the patient a pair of spectacles (i.e., over-the-

counter reading glasses) to demonstrate the potential benefits of optically correcting latent hyperopia. In addition, the optometrist should tell the patient that under certain circumstances, correcting near vision can adversely affect distance visual acuity. A good alternative for some patients is the prescription of contact lenses, which can relax accommodation more. The standard, and safest, treatment for symptomatic hyperopia is wearing prescribed lenses with low amounts of plus power. Patients with moderate degrees of hyperopia are more likely to require at least part-time correction, especially those who have significant near demands or have accommodative or binocular anomalies. Many practitioners have long been frustrated with traditional treatments of symptomatic latent hyperopia (fogging techniques, bifocals, etc.). Cyclorefraction and treatment of latent hypermetropia [7] offers both practitioners and patients an efficient, rapid-acting, and satisfying alternative treatment for this vexing accommodative anomaly.

#### *Purpose*

To evaluate the response of the treatment of uncorrected latent hypermetropia in adults with chronic headache.

#### **Methods**

This was a prospective descriptive study. The duration of the study was 6 months. 50 patients in the age group of 18-40 yrs referred to the ophthalmology out patient department for evaluation of headache were included in the study.

In all the patients other causes of headache like medical, dental, ENT, neuroophthalmology were excluded. Clinical history like occupation, amount of near work, relation of headache to constant near work were taken. visual acuity measured. Cycloplegic retinoscopy with 1% cyclopentolate was done. correction was given after reduction for distance so that the latent hypermetropia was treated.

Patients who were doing constant near work and active in reading like students and computer users were given full retinoscopic reading others were given 1/2-3/4 the retinoscopic reading. After spectacle prescription the patients were followed up for 1 month, 2 month and 6 months. Responses are evaluated based on a 6 point patient satisfaction score (very satisfied to very dissatisfied) score of 6 on 0-6-point Likert scale.

## Results

50 subjects between age group of 18-40 yrs participated. 14 were males and 36 were females. Mean age was 32±2 yrs. Patients who had scored as

satisfied and very satisfied were considered treated. 55% were treated at 1 month, 75% were treated at 2 months and 81% were treated at 6 months. Patients who were less than 30 were benefitted 66.7%, 87.9%, 93.9% at 1 month, 2 month, and 6 month respectively. Patients aged over 30 benefitted 49.3%,

**Table 1:** Patient satisfaction in different age groups

	Patient <30yrs	Patient >30yrs
1 month	66.7%	49.3%
2 month	87.9%	73.1%
6 month	93.9%	74.6%

73.1%, 74.6% at 1 month, 2 month, 6 month, respectively. Table 1 showing patient satisfaction in different age groups.

## Discussion

In day to day practice ophthalmologists come across many cases of headaches usually referred to by other specialitis. Generally the manifest [8]. Hypermetropia as determined by non cycloplegic retinoscopy is treated. Accommodation plays an important role in determining the prescription. young patients with good accommodation reserve do not need the total correction however constant near work in them fails the accommodation and they suffer from chronic headaches.

Similarly as the patient ages to 30 plus the accommodation again fails and they have near vision blur and constant headaches. Some patients with hyperopia do not initially tolerate full optical correction. Patients with latent hyperopia who prove intolerant to the use of full or partial hyperopic correction may benefit from initially wearing the correction only for near viewing;. To determine the final spectacle lens prescription, the clinician should carefully consider the patient's vision needs. Newer high-index lens materials and aspheric lens designs have reduced the thickness and weight of high plus-power lenses, increasing their wearability and patient acceptance.

In this study patients coming with headache and in whom other causes of headache were ruled out underwent a cycloplegic retinoscopy . younger patients who did more near work accepted full correction and at the end of 6 months 93.9% were free of headaches.

Patients more than 30 yrs were given 1/2 - 3/4 correction depending on the acceptance and 74.6%

were free of headaches. previous studies have also concluded that uncorrected latent hypermetropia among young adults is one of the important cause for chronic headaches .

## Conclusion

This study showed that age groups 18-40 yrs who presented with recurrent headache with no secondary cause were benefitted with latent hypermetropia correction. Thus this study emphasis on the importance of cycloplegic retinoscopy and latent hypermetropia correction for young adults complaining of headache.

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