

Effect of Loratadine on the Lateral Phoria of Young Hyperopes

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ABSTRACT:

Loratadine is one of the second generation antihistamines used in the treatment of allergies and which has no sedating effect. This study aimed at determining the effect of Loratadine on lateral phoria of young Hyperopes. The study was carried out using 50 volunteer students (31 males and 19 females) of Abia state University, Uturu, who were between 18 & 30 years (mean age 22.86 ± 3.26 years) and were also hyperopic. 10mg of Loratadine was administered orally. The subjects acted as their own control as the lateral phoria tests at far and near were conducted pre and post administration of Loratadine. The induced values were checked 60mins, 120mins and

180minutes after oral administration of Loratadine. Using t-test statistical analysis, results showed that the peak effect of Loratadine on lateral phoria occurred at 60 minutes post drug administration. Statistically, there was a significant change ($P > 0.05$) in habitual lateral phoria at far 60 minutes and 120minutes post administration respectively and only at 60minutes post administration for lateral phoria at near. The change in lateral phoria both at far and near was towards exophoria.

KEYWORDS:

Loratadine; lateral phoria at far; lateral phoria at near; hyperopia; young adults

INTRODUCTION

The eye being a delicate and important part of the body should be kept in good health condition. The eye could be affected by several diseases or conditions such as allergies¹.

Phoria also known as heterophoria is a latent deviation of the line of sight of the eyes from the relative position². It is the tendency

of the eyes to deviate under binocular fixation and turn from parallelism: in, out, up or down but this is held in check by compensatory fusional vergence³. In the fusion free state, it is entirely possible that the visual axes converge or diverge in a horizontal plane (Lateral phoria); again, the axis of one eye may be higher or lower than its mate (vertical phoria), or a combination of

the two may take place. This condition is called heterophoria⁴. The phoria position thus is the position the visual axes take with respect to one another in the absence of all stimuli to fusion⁵. Lateral phoria is the latent tendency of the eyes under binocular fixation to deviate in the horizontal direction⁶. It is classified into orthophoria, which is the absence of eye deviation or ocular movement on interruption of fusion; exophoria, which simply put is a condition where the visual axes tend to deviate outwards on interruption of fusion; and esophoria, which is a condition where the visual axes tend to deviate inward on interruption of fusion⁷. The phoria position is usually considered both at distance (far) and near.

Loratadine is an oral, non-sedating, long acting second generation tricyclic antihistamine drug used for the treatment of allergy⁸. Each tablet contains 10mg micronized Loratadine usually administered orally, one tablet once or twice a day with or without food. Loratadine acts by selectively antagonizing peripheral histamine H₁-receptor which is responsible for many features of allergic reactions⁹. It is indicated usually for adults and children 2 years and above for temporary relief of symptoms of hay fever or allergic rhinitis and other allergic symptoms such as (itchy eyes) itchy eyes seen in allergic conjunctivitis, redness, sneezing, running nose and itchy nose or throat⁹. The most common adverse effects arising from Loratadine administration include headache, fatigue, wheezing, breathing difficulties, swelling of face, lips,

tongue and other body parts & earache. Adverse effects affecting the eye include eyepain, photophobia, swelling of eyes and anti-muscarinic effects such as blurred vision, abnormal lacrimation, mydriasis, dry mouth & gastrointestinal disturbances¹⁰.

Systemically administered drugs are known to produce effects in the eye when a sufficient concentration reaches various sites of action in the eye. This means that drugs administered systemically, such as Loratadine, even for diseases not specifically located in the eye, can still affect the eye structures and visual functions¹¹. It is common knowledge that symptoms of mild itching of the eye may be as a result of small amounts of hyperopia. This implies that at some point, antihistamines such as Loratadine would have been prescribed to patients in the eye clinic to relieve itchy sensation occurring primarily as a result of hyperopia. This study therefore aimed at determining the effect of Loratadine on the lateral phoria of young hyperopes.

METHOD

This research study was designed to determine if the oral anti-allergic drug, Loratadine, had any effect on the lateral phoria of young hyperopes. It employed an experimental design and the subjects acted as their own control. Fifty (50) hyperopic and healthy students of Abia state University, Uturu, within the ages of 18 and 30 (mean age 22.86 ± 3.26 years) were selected from the volunteers for the study. Ethical clearance to carry out the study

was given by the Abia State University ethical committee. The subjects were briefed about the study and their consent obtained. Loratadine drug was locally purchased from a pharmaceutical shop.

External examination was conducted to ensure there were no ocular abnormalities, visual acuity and ophthalmoscopy were also carried out and refraction was done using both objective (retinoscopy) and subjective methods to ensure that the subjects were hyperopic only.

To ensure accuracy and validity of this study, subjects who had manifest deviations (tropia), ocular pathologies and other ocular anomalies, those who had refractive conditions other than hyperopia, those who were under any form of therapy or medication and those who had shown unusual reactions to Loratadine even in the past, were all excluded from the study.

Prior to the administration of the drug Loratadine, the baseline lateral phoria at far and at near for each of the 50 subjects was measured using the phoropter. Proper phoropter adjustments were made for each subject and the Von Graefe technique was used in measuring the lateral phoria^{7, 12}. The subjects were then given 1 tablet (10mg) of Loratadine each and this was orally administered with water. Their Lateral phoria at far and near were measured after 60 minutes of ingesting the drug. Subsequent lateral phoria measurements were taken 120 minutes and 180 minutes post administration. Data obtained were presented in tables and analyzed using t-test statistics.

RESULTS

There was a change from mean baseline lateral phoria of 1.32^Δ esophoria to a mean induced lateral phoria value of 1.02^Δ exo 60 minutes after oral administration of Loratadine. The induced change was 2.34^Δ towards exophoria and this represented the peak induced lateral phoria value at far. A slight induced phoria change of 1.44^Δ exo and 0.18^Δ exo were also recorded 120 minutes and 180 minutes post administration respectively (table 1).

For lateral phoria at near a similar peak change from mean baseline lateral phoria of 2.10^Δ exo to a mean induced lateral phoria value of 4.14^Δ exo was observed 60 minutes after oral administration of Loratadine. This peak value gradually decreased from 4.14^Δ exo to 2.88^Δ exo 120 minutes after administration and at 180 minutes post administration, the lateral phoria value returned to a value (1.56^Δ exo) close to the baseline (table 2).

DISCUSSION

The study determined the effect of 10mg Loratadine on the lateral phoria at far and near of 50 young hyperopes between the ages of 18 – 30 years.

Using t-test analysis, Loratadine had a statistically significant ($P > 0.05$) effect on far lateral phoria 60 minutes and 120 minutes post administration. Its effect on lateral phoria at far after then was statistically insignificant. For lateral phoria at near, a statistically significant effect was only observed 60 minutes after

administration. Its effect was no longer significant after then.

This statistically significant effect of Loratadine on lateral phoria can be accounted for by its anticholinergic properties. Several studies^{9, 10, 13} have also reported this anticholinergic property of Loratadine, especially its anti-muscarinic effect. Loratadine will act as a competitive antagonist to the cholinergic pathway due to this anti-muscarinic effect¹⁴.

Pavan–Langston¹⁵ opined that antihistamines by virtue of their anti-muscarinic properties could alter pupillary reactions such as pupillary direct and consensual responses to light and accommodation, and pupillary size thus inducing mydriasis.

Jaanus¹⁶ also attested to these possible ocular side effects of systemically administered Loratadine adding that they could also cause paralysis of the ciliary muscle thus resulting in impairment of accommodation and decrease in accommodative convergence per change in accommodation (AC/A) ratio.

There was no other significant effect on lateral phoria at near after the statistically significant peak effect recorded 60 minutes post administration. This is in contrast to what was seen at far and is probably due to the fact that there is increased accommodative effort at near which naturally opposes the decrease in AC/A ratio produced by Loratadine. This correlates with the findings of Borish¹⁷ who reported that a decrease in AC/A ratio could be

compensated for by higher accommodative effort during near visual task.

The peak effect of Loratadine on lateral phoria both at far and at near occurred 1 hour (60 minutes) post administration of the drug. This is in accordance with the report of some studies^{9, 10} which also recorded a peak effect of Loratadine occurring 1 to 2 hours after its ingestion. There was a gradual recession in the magnitude of the drug's effect on lateral phoria both at far and near after this period.

The effect of Loratadine on lateral phoria was the induction of a shift towards more exophoria. This shift towards exophoria may be as a result of ocular adverse effects such as mydriasis, inhibition of accommodation and blurred vision arising from the anticholinergic (atropine-like) effect of antihistamines. Antihistamines by virtue of their possession of this anti-cholinergic property will inhibit the parasympathetic innervations of the sphincter muscles of the iris and the ciliary muscles of the eye^{9, 14, 18}. This will cause pupil dilation and paralysis of the ciliary muscle¹⁹. As a result, a decrease in amplitude of accommodation and hence AC/A ratio will occur. This reduction in accommodative convergence will thus give rise to latent outward deviation of the eyes (exophoria)²⁰. This is supported by the report of Grosvenor²¹ that a reduction in accommodation is usually associated with a decrease in amount of accommodative convergence and thus a shift of lateral phoria towards exo direction.

CONCLUSION

1tablet (10mg) Loratadine caused a significant change in lateral phoria of young hyperopes both at far and at near.

Loratadine had a significant effect on lateral phoria at far 60 and 120minutes post administration, after which the effect gradually reduced and was no longer statistically significant. It only had a significant effect on lateral phoria at near 60 minutes after ingestion and there was no more significant effect thereafter.

The peak effect of Loratadine occurred 1hour (60 minutes) post administration after which there was a gradual recession in the magnitude of change and this recorded change was a shift towards exophoria. Hence it is suggested that Loratadine could be incorporated in the management of some ocular deviations such as high esophoric conditions and accommodative spasm in young adults since it cause a shift towards exophoria.

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TABLES

Table 1: Mean baseline and mean induced Lateral phoria at far for young hyperopes after intake of 1 tablet (10mg) Loratadine.

(Mean baseline Lateral phoria at far = 1.32^Δ eso)

Post intake time (Minutes)	Mean Induced Phoria(^Δ D)	Induced change (^Δ D)	Percentage change(%)
60	1.02 exo	2.34 exo	177.27
120	0.12 exo	1.44 exo	109.09
180	1.14 eso	0.18 exo	13.64

Table 2: mean baseline and mean induced lateral phoria at near for young hyperopes after intake of 1tablet (10 mg) Loratadine.

(Mean baseline lateral phoria at near = 2.10^Δ exo)

Post intake time (Minutes)	Mean Induced Phoria(^Δ D)	Induced change (^Δ D)	Percentage change (%)
60	4.14 exo	2.04 exo	97.14
120	2.88 exo	0.78 exo	37.14
180	1.56 exo	0.54 exo	25.71