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Original Article

Adaptation Time Required After Change in Astigmatic Prescription as Compared to Spherical Prescription in Teenagers

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Purpose: To find out the normal adaptation time of different types of refractive errors after a significant change in refractive prescription in glasses users.

Method: A cross-sectional study was conducted on 62 subjects having different types of refractive errors such as myopia, hypermetropia, and astigmatism. Teenagers aged 12-20 years, who had already using glasses, were included in this study. Consent of the patients was taken and refraction was performed. The patients were called for follow-up after 3-5 weeks. Results were obtained by asking the patients to fill the self-designed proforma and questionnaire.

Results: Only teenagers were included in this study and results showed that patients with 33.9% myopia, 20.97% Hypermetropia and 45.2% astigmatic refractive error occasionally had a problem in adapting to new glasses prescription. The problem in the distance and near vision, in mobility, the complaint of headache, anxiety, the complaint of eye strain, micropsia, blurred vision and complaint of image distortion. adaptation time varies according to the type of refractive error such as 3.2% were adapted within 2 weeks, 56.5% patients were adapted within 3 weeks while 27.4% required 4 weeks to adapt the new glasses and 11.3% were adapted within5 weeks.

Conclusion: The teenagers easily adapt to the new glasses as compared to older patients. The teenagers with Hypermetropic and myopic refractive error fully adopt the new eyeglasseswithin 3-4 weeks of adaptation. But teenagers with astigmatic refractive error required more than 4week to adapt.

Keywords: Myopia, hypermetropia, astigmatism, adaption time.

Introduction:

Refractive error or ametropia is the state in which the ocular structures of the eye fail to directly focus the parallel rays of light coming from infinity onto the retina and the image observed by the individual is not clear. There are three main types of refractive errors Myopia, Hyperopia and astigmatism.[1] Refractive errors are the commonest form of eye diseases that cause decreased vision. Different optical devices such as, eyeglasses, contact lenses and optical procedure such as, refractive surgery can be used for the correction of refractive errors.[2] The eyeglasses are one of the major tools for the rectification of optical imperfections that are recommended by primary eye care physician.

The recommending instructions that are planned for the patients are helpful so that they can adapt the change in their new optical prescription without any difficulty and so evade dissatisfaction.[3] Adaptation time means the adjustment of the visual system to new prescription and sudden shift in perceptual appearance. Adaptation occurs with the improvement of visual acuity provided by the new remedy. The essential aim for patient satisfaction is to provide a better refractive measurement as the dissatisfaction of the patient to refractive measurement may decline the connection between doctor and patient. It has been submitted that the glasses magnification and minification are a problem in adapting to new eyeglasses prescription.[4,5] the age of the subject/patient is another factor that had a poor impact on adapting the new spectacles. Aged people may face many difficulties in adapting the modified eyeglasses as compared to teenagers who easily adapted and happy with their new spectacles.[6] The eyeglasses recommended by the primary eye care consultant to patient is not adjustable due to adaptation difficulty.[7]

The non-tolerance to adapt the new spectacles may be of two types; there may be non-tolerance to new glasses prescription that is recommended by the primary eye care consultant and secondly, there may be dispensing problem.[8] The astigmatic patient does not easily adapt the change in spectacles prescription because of the changed axis and number may cause 3-dimensional distorted vision which is the reason of Asthenopic symptoms such as, headache, eye strain, and blurred vision etc.[9] Adaptation to newly recommending spectacles for the rectification of astigmatism is predominantly applicable clinically and many eye care physicians conclude that astigmatism can be corrected with eyeglasses, contact lenses, intraocular lenses and with different surgical procedures.[10]

Materials and Method:

This study was conducted on 62 subjects having different types of refractive errors such as myopia, hypermetropia, and astigmatism visiting Mayo Hospital Lahore. Teenagers aged 12-20 years, who had already using glasses, were included in this study. The study group was taken without discernment of gender, refractive prescription and excluding those who were mentally retarded, who had other pathological disorders of the eye, uncooperative patients, those who were not giving their data and those who were unable to come for follow-up. Before the start of the research consent of the patients was taken and then refraction was performed. The patients were called for follow-up after 3-5 weeks. Results were obtained by asking the patients to fill the self-designed proforma and questionnaire fed on the computer using the SPSS 20.0 software. The results were analyzed and tabulated using the same software.

Results:

In this study, 62 patients aged 13-19 years were enrolled out of which 23 patients were male and 39 patients were female. 21(33.9%) teenagers had Myopia, 13(20.97%) patients had Hypermetropia and 28 (45%) had Astigmatism. Results showed that in six patients with myopic refractive error problems were found in adapting to new glasses prescription. These included problem in distance vision, in near vision, in mobility, a complaint of headache, complaint of micropsia and anxiety. Thirteen teenagers were hyperopic and three out of them had problems in adapting to their newly prescribed glasses; these included problem in distance vision, the complaint of headache and anxiety. All 28 astigmatic teenagers had problems in adapting even upto 5th week; their problems included problem in distance vision, problem in near vision, in mobility, complaint of eye strain and headache, complaint of micropsia and complaint of anxiety, complaint of blurred vision and image distortion. Adaptation time vary according to the type of refractive error such as; 1.61% Myopic and Astigmatic required 2 weeks, 25.81% Myopic, 20.97% Hyperopic and 9.68% Astigmatic required 3 weeks, 4.84% Myopic and 24.19% Astigmatic required 4 weeks, 1.61% Myopic and 9.68% Astigmatic patients required 5 weeks to adapt the new prescription.

Table 1: Adaptation time of the refractive error

Adaptation time	Type of refractive error			Total
	Myopia	Hyperopia	Astigmatism	
2weeks	1	1	1	3
3weeks	16	12	6	34
4weeks	3	1	14	18
5weeks	1	1	5	7
Total	21	13	28	62

Chi square = 21.3161, p = 0.001609

There is statistically significant difference between

the types of refractive errors and the time taken by each to adapt to newly prescribed glasses.

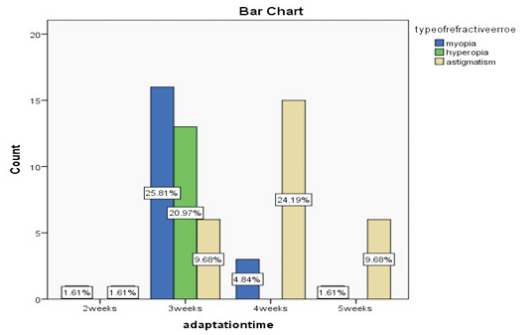

Fig 1: Adaptation time in a different type of refractive errors,

Discussion:

The optometrist delivers information about the different problems for non-tolerance to new eyeglasses prescription. When the optical prescription is changed the patient may face many ocular and non-ocular problems. Some may be satisfied with their new eye spectacles and some may return to previous eyeglasses.[11] There are limited researches in the literature about the disappointment of the patient to adopt the change in their eyeglasses prescription/new spectacles. Riffenburgh et al. testified that 2.3% patients out of a total of 5467 reverted for re-evaluation because they were unhappy with their new eyeglasses.[12]

In a study it was hinted that the age of the subject/patient could be another factor that had a poor impact in adapting to the new spectacles prescribed by the optometrist. So, many optometrists suggested routine eye examinations in aged people. This study also shows that many aged people may face many difficulties in adapting to the modified eyeglasses as compared to teenagers who easily adapted and were happy with their new spectacles.[6] Conversely it was also probable that the proper advice might be helpful to make refractive amendments more contented for the patients and thus, satisfied them with their modified eyeglasses. The adaptation time in adapting the change in prescription may vary according to the patient refractive error. As compared to other refractive error the astigmatic refractive error may take more time to adapt the change in spectacles prescription/new spectacles.

The current cross-sectional study was carried out by taking 62 subjects as a study group. The patients were asked about 10 problems they encountered with their modified eyeglasses during this time and one question about adaptation time in which they were adapting to the change in their prescription. The patients with hypermetropia (or farsightedness) were not restricted to high plus number for distance because as little as plus 0.25D was prescribed in their spectacles rectification.[13] In our study only 13 (21%) patients were hypermetropic and they all adapted to the new spectacles barring three problems that were reported; problem in distance vision, problem of headache and complaint of anxiety. Previous studies suggest that the astigmatic patient do not easily adapt to the change in spectacles prescription because the cylindrical number is changed and changed axis may cause 3-dimensional distorted vision which is the reason for asthenopic symptoms such as, headache, eye strain, and blurred vision etc.[9] In present study the number of astigmatic patients was 45.2% and quite a lot of problems were found in adapting to new eyeglasses in these patients such as problem in distance vision, the problem in near vision, the problem in mobility, the problem of eye strain, the problem of headache, problem of micropsia, problem of anxiety, the problem of blurred vision and the problem of image distortion. The present study also shows that the adaptation time varies according to the type of refractive error. In a previous study Strang et al[14] reported that patients with spherical refractive error take at least one week to adapt to the new eyeglasses but in our study 1(1.61%) myopic patient adapted within 2 weeks, 16(25.81%) required 3 weeks to adapt to the new spectacles, 3(4.84%) high myopic required 4 weeks to adapt to the change in prescription. All hypermetropic patients (20.97%) adapted to the new spectacles within 3 weeks and they were satisfied. Our study also demonstrated that, like other studies, the adaptation period in astigmatic patients may vary at various time periods.[15]

Conclusion:

This study shows that teenagers with Hypermetropic refractive error fully adapt to the new eyeglasses within 3 weeks but sometimes they had the problem of headache, anxiety. The teenagers having myopic refractive error adapt the new spectacles but they face some problems; problem in distance, the problem in near, the problem in mobility, micropsia, and

anxiety during 3-4 weeks of adaptation. The teenagers with astigmatic refractive error were all satisfied with new glasses but occasionally they face problem in distance, in near, during mobility, the complaint of headache, any anxiety within 4 weeks of the adaptation period. The spherical refractive errors take less time to adapt to the changed prescription as compared to astigmatic refractive error. The myopic and hyperopic patients have adapted to new glasses within 4 weeks but astigmatic patients required more than 4 week to adapt.

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