ISSN 2822-2032 (Print) 2822-2040 (Online)

Medical Journal of Eastern Nepal

Volume 01, Number 02, Issue 02, December 2022, 56-57

Short Communication

REFRACTIVE POWER PRESCRIPTION IN CHILDREN WITH STRABISMUS

Sanjeev Bhattarai, Pragati Gautam Adhikari

Department of Ophthalmology, Maharajgunj Medical Campus, Institute of Medicine, Maharajgunj, Kathmandu, Nepal

Submitted: 26-August-2022, Revised: 22-October-2022, Accepted: 25-November-2022

DOI: https://doi.org/10.3126/mjen.v1i02.51166

INTRODUCTION

Strabismus or squint is the condition where the visual axes of the two eyes do not meet at the point or object of regard. Under normal conditions, both eyes are in proper alignment. But during strabismus one eye deviates away from the fixation point. It may be latent squint (Heterophoria) or manifest squint (Heterotropia). Deviation of an eye during squint may be inward (Esotropia), outward (Exotropia), upward (Hypertropia) and downward (Hypotropia). Regarding the laterality and onset, it may be unilateral or alternating, congenital or acquired.[1]

SIGNIFICANCES OF OPTIMUM POWER PRESCRIPTION IN STRABISMUS

American Academy of Optometry (AAO) recommends routine eye examinations of children beginning from the age of 6 months. Some childhood eye and visual problems are complicated by the presence of refractive errors. But early detection and management of refractive error even in strabismic cases help a child to achieve optimal acuity, binocularity, and overall development. Optometrists should be fully aware of the impact of refractive power prescription on pediatric ocular and binocular vision disorders. Inappropriate refractive error prescription may hamper the child's optical and neural development with other consequences. Knowledge of the normal developmental process of optical components of the human visual system is very important before the prescription of refractive power. The rationale for modification of spectacle prescription in children with refractive error with associated with strabismus is to relax accommodation in an esodeviation and to exert accommodation in an exodeviation. [1,2]

HOW MUCH TO PRESCRIBE IN STRABISMUS? Following guidelines are suggested

First of all the patient is examined for the presence or absence of esophoria/esotropia or exophoria/exotropia with the patient's glass off first and then on (his/her old prescription). Now the prescription of new glasses will depend upon the state of muscle balance between the two eyes after completion of cycloplegic refraction. In the presence of esophoria and esotropia, full hypermetropic correction should be given. If full cycloplegic correction is not given, the child will continue to accommodate for near with resultant convergence and persistence of esotropia for near in the more hypermetriopic eye. Persisting esotropia results in extrafoveal fixation with resultant decrease in vision in the more hypermetropic eye and amblyopia while the child is constantly wearing glasses. If the child is already wearing hypermetropia correction, which is associated with exophoria/exotropia, it means this much correction is too strong and is relaxing the accommodation and convergence to such an extent causing the strabismus. In this situation, the minimum plus is given which retains 6/6 vision. If astigmatism is also present, then plus cylinder is prescribed in full while minimum plus sphere is given. If myopia is associated with exophoria/

***Corresponding author:**
Sanjeev Bhattarai
Email: bhattarai_sanjeev@yahoo.com
ORCID: 0000-0002-2774-0637

Citation
Bhattarai S, Adhikari P G, Refractive Power Prescription in Children with Strabismus, MJEN. 2022 December; 1(2): 56-57.

exotropia, then full minus correction is prescribed to enable the patient to exert accommodation and convergence to control the strabismus. High degree of myopia at birth can result in esotropia in early childhood. In this case the infant's far point is very close to the eyes making the eyes converge all the time to see clearly at this distance, so full myopic correction is needed to treat constant esotropia. If myopia in teenager or adult is associated with esophoria, the clinician should reduce the minus correction. But if there is esotropia, then transpose the correction to plus cylinder and a minimum minus sphere. Myopia when associated with exophoria or exotropia, full minus correction is prescribed to enable the patient to exert accommodation and convergence and control the strabismus. Regarding hypermetropia, if it is associated with exophoria/exotropia, then prescription of plus correction will further relax accommodation and convergence and will worsen the strabismus. In this situation either give minimum plus or if astigmatism is present, then transpose the cylinder and prescribe minus cylinder with a minimum plus sphere to have maximum vision. As the vision improves and if the exophoria/exotropia is not fully corrected, then reduce the amount of plus sphere[3,4]

CLINICAL CONSIDERATIONS BEFORE POWER PRESCRIPTION

If strabismus and amblyopia are associated with anisometropia, full correction of the refractive error should be prescribed in the more ametropic eye. In a case of hypermetropia with exotropia, the most frequently prescribed correction for distance exodeviation < 15PD is the least plus to achieve best visual acuity. For moderately large exodeviation, minus overcorrection according to estimation from AC/A ratio should be prescribed. If the proper accommodative response is made then exotropia is controlled. But the prescription (up to -2.00Dsph) should not degrade the visual acuity. Minus overcorrection is contraindicated and plus add may be needed in a case with exotropia with accommodative insufficiency. If plus addition changes the exodeviation from intermittent to constant, bifocal should be avoided for near. For fully accommodative esotropia (> +3.00 D), full cycloplegic prescription and additional correction for close work should be provided depending on the status of near visual acuity. In cases of purely refractive accommodative esotropia, eyes will be straight after full cycloplegic correction for far and near. For individuals with high AC/A ratio, bifocal glasses should be given for near with optimum distance correction. Usually from birth to six years if power is greater than + 2.00D glasses are prescribed for refractive accommodative esotropia. Full hypermetropic correction should be prescribed for hypo accommodative, partially accommodative and infantile accommodative esotropia.[4,5]

Spectacle power prescription is also influenced by the strength of the refractive error and the visual acuity. The more the refractive error, the less chances of modification of the prescription. Reduction of visual acuity of one line may be tolerable for the younger children but not in school going children as they would require good visual acuity for their school work. Children needing a correction more than 5 D and if wearing glasses for the first time may take a few weeks to accept the correction. An overcorrected minus lens may be used for the treatment of exodeviations. For intermittent exotropia, a minor amount of myopia should also be corrected to stimulate accommodation and convergence and to align the eyes. But if the error is hypermetropia with normal vision, a prescription may not be needed as it reduces the need to converge. High hypermetropia with intermittent exotropia should have an under-correction of the error. After prescribing spectacles, the child should be advised a follow-up visit after four to six weeks to monitor compliance and adaptation to the power provided to him/her.[6,7,8]

CONCLUSION

Refractive error is the commonest visual problem in children even with strabismus. Refraction and spectacle prescription in the pediatric population could be challenging regarding visual acuity, subjective refraction, variable control of accommodation, and risk of amblyopia. So early detection and appropriate management with glasses may help to restore optimal vision and good binocularity for the future.

REFERENCES

1. Khurana A.K. Theory and Practice of Squint and Orthoptics. Second edition; CBS Publishers and Distributors Pvt Ltd: New Delhi; 2015; pp.335-36.
2. Doma W, Dager A. Pediatric Spectacle Prescription.DJO. 2017; 28:9-11.
3. Ashok A. Refraction and glass prescription in pediatric age group. Kerala J Ophthalmol.2019; 31:78-80.
4. Irfan S. Understanding Strabismus. First edition; Jaypee Brothers Medical Publishers Pvt Ltd: New Delhi; 2014; pp.30-31.
5. Sainani A. Special considerations for prescription of glasses in children. J Clin Ophthalmol Res 2013; 1:169-73.
6. Elizabeth EC, Michael WR, Susan AC. Clinical Management of Strabismus. Second edition; Butterworth-Heinemann: England; 2008; pp. 76-91.
7. Garg A, Rosen E. Strabismus. First edition; Jaypee Brothers Medical Publishers Pvt Ltd: New Delhi; 2009; pp. 87-125.
8. Rowe F. Clinical Orthotics. Third edition; Wiley-Blackwell Publishers: England; 2012; pp. 138-188.