A CLINICAL STUDY ON CHARACTERISTICS OF AMBLYOPIA PRESENTING IN A TERTIARY EYE CARE CENTRE

K. Rajasekar[1], Suchieta Jennil P[2]

[1]Professor and HOD, Department of Ophthalmology, Government Medical College, Omandurar, Government Estate, Chennai, Tamil Nadu.
[2]Junior Resident, Department of Ophthalmology, Regional Institute of Ophthalmology, Government Ophthalmic Hospital, Egmore, Chennai, Tamil Nadu.

ABSTRACT

BACKGROUND

Amblyopia is characterized by decrease in best corrected visual acuity which can be unilateral or bilateral with no identifiable cause in the eye and visual pathway. Early diagnosis of amblyopia is very essential as the chance of improvement in visual acuity to standard levels is high when treatment is instituted early in childhood.

MATERIALS AND METHODS

40 patients of age 4 to 40 years with amblyopia due to various causes were included in the study. A detailed history of the patient, unaided visual acuity, best corrected visual acuity, slit lamp examination for anterior segment evaluation, fundus examination for posterior segment evaluation, cycloplegic refraction, assessment of strabismus and extra ocular movements was evaluated at the time of presentation and followed up during the study period.

All patients with amblyopia having refractive errors were advised appropriate glasses before occlusion therapy. Refraction was repeated once in two months. Occlusion therapy was advised to all patients combined with near vision activities. The near vision activities included reading, threading beads, writing, drawing, etc. The importance of compliance to treatment was emphasized to the patients and their family. They were followed up regularly and best corrected visual acuity was recorded.

RESULTS

In our study maximum number of patients (90%) were of age <15 years, who are school going children, there was no sex predilection for amblyopia, amblyopia was more prevalent in rural population (67.5%) and defective vision was the most common presenting complaint of the patients followed by strabismus. The mean visual acuity in logMAR improved from 0.63 before treatment to 0.33 at the end of 6 months of treatment. The mean improvement in visual acuity at 6 months of treatment was maximum for children less than 7 years of age (0.44 improvement in logMAR), followed by children of age 7 to 13 years (0.31 improvement in mean logMAR). The least improvement in visual acuity was observed in patients more than 13 years (0.17 improvement in mean logMAR).

CONCLUSION

In our study, most of the patients were school going children of age <15 years with most children from rural population. Correction of refractive errors, occlusion therapy and near vision activities helped in improvement of visual acuity in the amblyopic eye. The response to treatment decreases as the age increases. Response to treatment is highest when the child is less than 7 years. Children of age 7 to 13 years had a lesser response, while the least improvement in visual acuity occurs in patients more than 13 years. Hence it is vital to detect amblyopia in early childhood by identifying conditions which may cause amblyopia.

KEYWORDS

Amblyopia, refractive errors, anisometropia, strabismus, occlusion, patching, occluders.

HOW TO CITE THIS ARTICLE: Rajasekar K, Suchieta Jennil P. A clinical study on characteristics of amblyopia presenting in a tertiary eye care centre. J. Evid. Based Med. Healthc. 2018; 5(30), 2222-2226. DOI: 10.18410/jebmh/2018/460

Financial or Other, Competing Interest: None.
Submission 30-06-2018, Peer Review 03-07-2018,
Acceptance 13-07-2018, Published 18-07-2018.
Corresponding Author:
Dr. Suchieta Jennil P,
Junior Resident, Department of Ophthalmology,
Regional Institute of Ophthalmology, Government Ophthalmic Hospital, Egmore, Chennai- 600002, Tamil Nadu.
E-mail: jennilpaulms@gmail.com
DOI: 10.18410/jebmh/2018/460

CC BY NC ND

BACKGROUND

Amblyopia is a decrease in the best correct visual acuity of an eye without any identifiable pathology in the eye or the visual pathway.[1] It may occur due to foveal pattern deprivation or abnormal binocular interaction or both.[2] The meaning of the word amblyopia is 'dullness of vision', 'ambly' means dull and 'ops' means vision.

Prevalence of amblyopia is 2.0% to 2.5% in the general population. Amblyopia is an important socioeconomic problem as it is a disabling condition for a person who needs high standards of visual acuity for his career. It also poses a

problem when the fellow normal eye suffers loss of vision. Hence it is important in identifying the condition promptly and instituting treatment without delay. The retinocortical connections in an amblyopic eye is not irrevocably damaged, rather it is dormant. Hence reactivation of these dormant connections through proper treatment will help regain standard visual acuity in the amblyopic eye.

Functional or reversible amblyopia occurs due to deprivation of form vision or abnormal binocular interaction. It is reversible, and the extent of reversibility depends on the age at which treatment was started and the duration of amblyopia. It includes anisometropic amblyopia, strabismic amblyopia, meridional amblyopia, stimulus deprivation amblyopia. Causes of stimulus deprivation amblyopia include media opacities like congenital cataracts, traumatic cataracts, surgical lid closure, unilateral ptosis.[3] Occlusion amblyopia is iatrogenically induced stimulus deprivation amblyopia which occurs after unilateral prolonged patching or atropinisation for a long duration[4] Organic or irreversible amblyopia occurs due to subtle retinal damage which cannot be detected on ophthalmoscopic examination.

Prevention of Amblyopia

Prevention of amblyopia requires screening for conditions causing amblyopia. Screening should start right from the birth and should be continued during routine health checkups which should include visual assessment. Any child with abnormal face turn or head tilt, poor pupillary response, ptosis, cataract, corneal opacity, poor fixation and strabismus should be referred to an ophthalmologist for detailed evaluation. Screening procedure is very valuable in detecting children in their sensitive period for amblyopia, when the amblyogenic factor can be eliminated and visual acuity can be restored.

Treatment of Amblyopia

Treatment of amblyopia is aimed at eliminating the cause of amblyopia and normalizing visual acuity to standard levels.

1. Elimination of the Media Opacities

Elimination of media opacities which cause amblyopia is important to provide a clear retinal image.

2. Management of Refractive Errors

In anisometropic amblyopia, bilateral ametropic amblyopia and meridional amblyopia, refractive error is the main causative factor. Hence a cycloplegic refraction should be done and appropriate refractive correction should be given. Refractive correction by itself improves visual acuity in these patients. After three to four weeks of spectacle adaptation, occlusion therapy may be started in these patients.

3. Occlusion Therapy

Occlusion therapy is prevention of the normal eye from taking up fixation so that the amblyopic eye is forced to be used. Inhibitory factors that arise from the fixating eye play an important role in the pathogenesis of amblyopia. Occlusion also removes the inhibitory factors arising from stimulation of the normal eye. The important factor before starting occlusion therapy is documentation of a reliable visual acuity based on which the improvement can be observed. Crowding phenomenon is important while treating amblyopia as visual acuity with single optotype improves prior to line acuity.[5] Compliance is very essential in occlusion therapy. Hence the parents and the patient should be well educated on the importance of compliance.

During occlusion therapy, active exercise for the amblyopic eye hastens the rate of visual improvement. Near vision activities like reading, threading beads, drawing, video games, etc. are advised for the amblyopic eye during occlusion therapy. For patients with extremely sensitive skin who cannot tolerate occluders with adhesives, extended wear occluding soft contact lens can be used.[6] Treatment requires high compliance. Hence proper education about the disease, the need for compliance to treatment and regular follow up, should be imparted to patients and family

Aim of the Study

To evaluate the characteristics of amblyopia, age of presentation, visual acuity at presentation and improvement with treatment.

MATERIALS AND METHODS

40 patients with amblyopia presenting to Department of Ophthalmology, Government Medical College, Omandurar Govt. Estate, Chennai, Tamilnadu. Once Amblyopia is recognised more detailed intervention is achieved by taking the patients to Squint and paediatric ophthalmology services, RIO GOH, Egmore, Chennai-600 008 and done. The patients willing and consenting for the process were included in the study.

Inclusion Criteria

1. Patients presenting with amblyopia.
2. Age 4 - 40 years.

Exclusion Criteria

1. Patient with No Light perception
2. Age <4 years
3. Patients with developmental delay

Patients of age 4 to 40 years with amblyopia due to various causes were included in the study. A detailed history of the patient, unaided visual acuity, best corrected visual acuity, slit lamp examination for anterior segment evaluation, fundus examination for posterior segment evaluation, cycloplegic refraction, assessment of strabismus and extra ocular movements was evaluated at the time of presentation and followed up during the study period.

All patients with amblyopia having refractive errors were advised appropriate glasses before occlusion therapy. Refraction was repeated once in two months. Occlusion therapy was advised to all patients combined with near vision activities. The near vision activities included reading, threading beads, writing, drawing, etc. The importance of compliance to treatment was emphasized to the patients and

their family. They were followed up regularly and best corrected visual acuity was recorded.

RESULTS

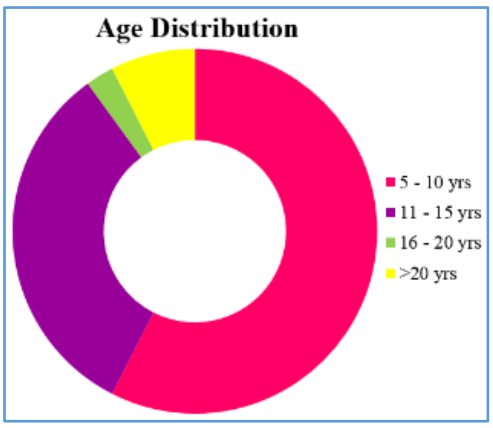

Chart 1. Age Distribution in the Study Group

57.5% of the patients in this study group belonged to age of 5 to 10 years. 32.5% of the patients belonged to age 11 to 15 years. 2.5% belonged to age 16 to 20 years. 7.5% belonged to age group >20 years. Hence maximum number of patients belonged to the age group less than 15 years who are school going children.

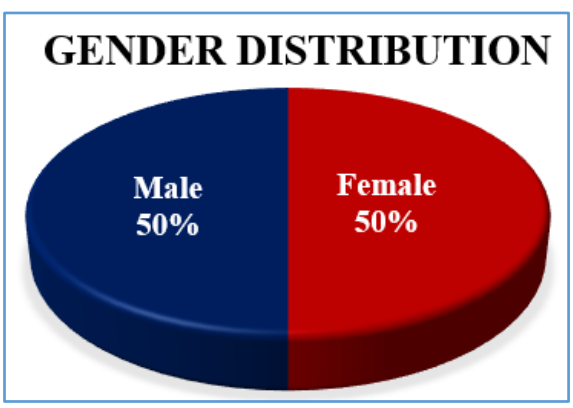

Chart 2. Pie Chart Showing Sex Distribution in this Study

There is no sex predilection in amblyopia in this study group. Males and females were equally affected by amblyopia in this study group.

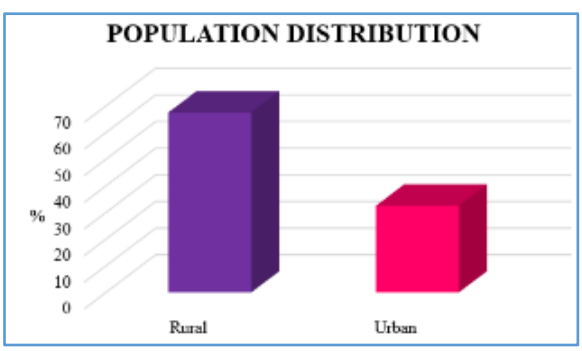

Chart 3. Bar Diagram Showing Distribution of Amblyopia in Urban and Rural Population

67.5 % of the patients with amblyopia belonged to rural population and 32.5% of the patients belonged to urban population. In this study the prevalence of amblyopia is more in rural population compared to the urban population.

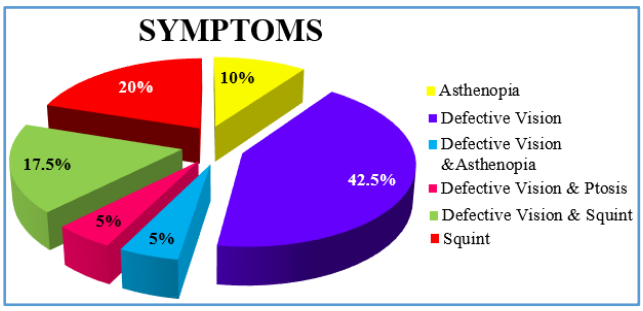

Chart 4. Presenting Symptoms of the Amblyopic Patients

In this study 42.5 % of the patients presented with defective vision. 20% of the patients presented with strabismus. 17.5 % complained of both defective vision and squint. 10% had asthenopia. 2 patients i.e., 5% had asthenopia with defective vision. 5% had defective vision and ptosis as presenting complaints.

In this study defective vision is the most common complaint of amblyopic patients. The second most common complaint was strabismus.

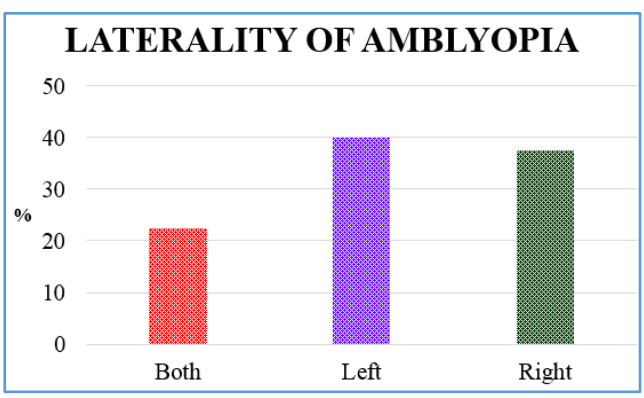

Chart 5. Laterality of Amblyopia

40% of the patients had amblyopia in left eye and 37.5% of the patients had amblyopia in right eye. Hence there was not much predilection for either eye in this study.

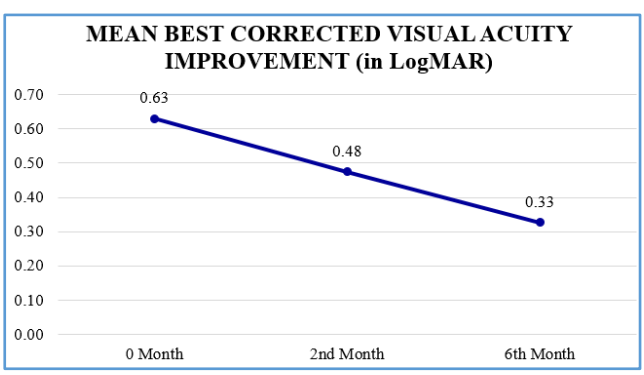

Chart 6. Shows the Improvement in Best Corrected Visual Acuity in logMAR in 2nd and 6th Month

This graph shows the improvement in mean best corrected visual acuity after treatment of amblyopia. The mean visual acuity by logMAR is 0.63 at presentation. The mean visual acuity in logMAR showed an improvement from 0.63 at presentation to 0.33 at 6 months.

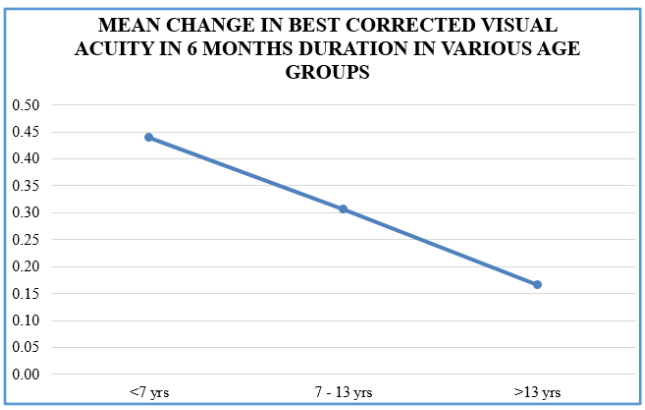

Chart 7. Mean Change in Visual Acuity at 6 Months in Various Age Groups

The mean change in the improvement of best corrected visual acuity at 6 months after treatment depends on the age of the patient. Children less than 7 years of age have the maximum improvement in visual acuity (0.44 mean change by logMAR) followed by children in age group 7 to 13 years (0.31 mean change by logMAR). The least improvement was observed in patients of age group more than 13 years (0.17 mean change by logMAR).

DISCUSSION

The Paediatric eye disease investigator group (PEDIG) did a randomized control study in which patching, and atropinisation are used as treatment modalities for children less than 7 years of age with moderate amblyopia. They concluded visual acuity improved in both patching and atropine by a similar magnitude. In our study also patching of the sound eye improved visual acuity in the amblyopic eye.[7]

Amblyopia treatment study 2A done by Holmes JM, Kraker RT, et al - Paediatric eye disease investigator group concluded full time patching of normal eye and patching for 6 hours was equally effective in severe amblyopia.[8] Amblyopia treatment study 2B done by Repka MX, Beck RW, et al - Paediatric eye disease investigator group, concluded patching of sound eye for 6 hours is equally effective as patching for 2 hours when combined with one hour of near vision activities.[9] In our study also part time patching of the sound eye improved visual acuity in the amblyopic eye.

David Wallace, Danielle L.Chandler, Paediatric eye disease investigator group studied the binocular visual acuity improvement in cases of bilateral refractive amblyopia with treatment, in children aged 3 to 10 years. They concluded that visual acuity improved in bilateral refractive amblyopia by use of spectacles.[10] In our study also cycloplegic refraction was done and spectacles were prescribed to patients with bilateral ametropic amblyopia and an improvement in visual acuity was noted similar to the above study.

In our study near vision activities were advised along with occlusion therapy, which resulted in improvement of the visual acuity in the amblyopic eye. This is similar to the randomized pilot study done by Paediatric eye disease investigator group which concluded near vision activities during patching of sound eye benefited visual improvement.[11]

In our study children less than 7 years of age showed the highest mean improvement in visual acuity followed by children of age group 7 to 13 years and patients more than 13 years had the least improvement in visual acuity. This is similar to study conducted by Holmes JM, Lazar EL et al, Paediatric eye disease investigator group. They studied the effect of age on improvement of visual acuity with treatment, in amblyopic children and concluded that children less than 7 years of age were more responsive to treatment than children of age 7 to 13 years, though some children in age 7 to 13 years showed a good response.[12]

CONCLUSION

Amblyopia is a disabling condition but a potentially preventable and treatable condition. In our study, most of the patients were school going children of age <15 years with most children from rural population. Correction of refractive errors, occlusion therapy and near vision activities helped in improvement of visual acuity in the amblyopic eye. The response to treatment decreases as the age increases. Response to treatment is highest when the child is less than 7 years. Children of age 7 to 13 years had a lesser response, while the least improvement in visual acuity occurs in patients more than 13 years. Hence it is vital to detect amblyopia in early childhood by identifying conditions which may cause amblyopia like refractive errors, cataract, strabismus, ptosis. Response to treatment also depends on compliance. Hence the patients and their family should be properly educated on the importance of compliance.

REFERENCES

[1] Kanski J. Clinical ophthalmology a systematic approach. 8th edn. Elsevier 2016.
[2] von Noorden GK. Amblyopia: a multidisciplinary approach. Proctor Lecture. Invest Ophthalmol Vis Sci 1985;26(12):1704-1716.
[3] Harrad RA, Graham CM, Collin JR. Amblyopia and strabismus in congenital ptosis. Eye (Lond) 1988;2(Pt 6):625-627.
[4] Burian HM. Occlusion amblyopia and the development of eccentric fixation in occluded eyes. Am J Ophthalmol 1966;62(5):853-856.
[5] Stuart JA, Burian HM. A study on separation difficulty: Its relationship to visual acuity I normal and amblyopic eyes. Am J Ophthalmol 1962;53:471-477.
[6] Eustis H, Chamberlain D. Treatment for amblyopia: results using occlusive contact lens. J Pediatric Ophthalmol Strabismus 1996;33(6):319-322.

[7] Pediatric Eye Disease Investigator Group. A randomized trial of atropine vs. patching for treatment of moderate amblyopia in children. Arch Ophthalmol 2002;120(3):268-278.
[8] Holmes JM, Kraker RT, Beck RW, et al. A randomized trial of prescribed patching regimens for treatment of severe amblyopia in children. Ophthalmology 2003;110(11):2075-2087.
[9] Repka MX, Beck RW, Holmes JM, et al. A randomized trial of patching regimens for treatment of moderate amblyopia in children. Arch Ophthalmol 2003;121(5):603-611.
[10] Wallace DK, Chandler DL, Beck RW, et al. Treatment of bilateral refractive amblyopia in children three to less than 10 years old. Am J Ophthalmol 2007;144(4):487-496.
[11] Holmes JM, Edwards AR, Beck RW, et al. A randomized pilot study of near activities versus non-near activities during patching therapy for amblyopia. J AAPOS 2005;9(2):129-136.
[12] Holmes JM, Lazar EL, Melia BM, et al. Effect of age on response to amblyopia treatment in children. Arch Ophthalmol 2011;129(11):1451-1457.