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Amblyopia in Children Aged 6-16 Years: Clinical Types

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ABSTRACT
Amblyopic patients Eye also have deficits in accommodation, contrast sensitivity and spatial orientation. It is usually Occurs in the first decade of life, but its effects can last for life time. Amblyopia is best diagnosed and treated as early as possible, but results from clinical study have challenged the notion of a significant age effect of treatment. A prospective observational study was conducted between 6-16 years visiting to our outpatient department with defective vision. Detailed history about present and past ocular problems, history of any medical or surgical treatment and family history were taken. A standard examination procedure was used for each study subject. In our study, we found that the most common amblyopia was anisometropic amblyopia (44%), followed by ametropic amblyopia (24%), strabismic amblyopia (12%), meridional amblyopia (10%) and least common was visual deprivation amblyopia (8%).

INTRODUCTION

The word "Amblyopia" (Greek: Amblyos=dull, ops=vision) "dullness of vision" was described by Hippocrates in 400 BC. One of the succinct definition has been attributed to Von Graefe, who defined amblyopia as the condition in which the observer sees nothing and the patient very little[1].

Amblyopia is defined as a "decrease of visual acuity caused by pattern vision deprivation or abnormal binocular interaction for which no causes can be detected by the physical examination of the eye and which, in appropriate cases, is reversible by therapeutic measures[2]".

Dr. Gunter von Noorden de ned amblyopia as a "decrease of visual acuity in one eye when caused by abnormal binocular interaction or occurring in one or both eyes as a result of patterned vision deprivation during immaturity, for which no cause can be detected during the physical examination of the eye(s) and which in appropriate cases is reversible by therapeutic measures".

Other term used for this type of amblyopia are functional amblyopia and amblyopia ex anopsia.

In the development of visual system critical period is between 1 week to 3 months of age. Clinically for practical purpose amblyopia is defined as vision of at least 2 Snellen lines difference in visual acuity between two eyes. Reduced vision in case of amblyopia it may range from missing few letters on the 20/20 line to hand movement vision[3].

Amblyopic patients Eye salso have deficits in accommodation, contrast sensitivity and spatial orientation. It isusually Occurs in the first decade of life, but its effects can last for life time. Amblyopia is best diagnosed and treated as early as possible, but results from clinical study have challenged the notion of a significant age effect of treatment[4].

Functional amblyopia is different from organic amblyopia, in which reduced vision caused by structural abnormalities of the eye or brain that that are independent of sensory input because of macular scar, optic atrophy or anoxic occipital brain damage.

In children amblyopia is the most common cause of visual impairment and it often persist into adulthood. The prevalence in childhood is estimated to be 1-4%. In the age between 20 and 70 years it is leading cause of monocular vision loss. In Adults prevalence of amblyopia was found to be 2.9% in one study, indicating need for early detection and treatment[5].

Amblyopia may be unilateral or, less often, bilateral. Most cases are usually esotropia in infancy or early childhood because of misalignment and others are because of anisometropic, or a combination of strabismus and anisometropia. Visual loss in amblyopia varies from mild to severe. In that About 25% of cases have visual acuity<6/30 and about 75% 6/30 or better.

The cause of amblyopia define the extent of visual deficit. More sever physiological deficit is seen in strabismic amblyopia than isolated anisometropic amblyopia and in case of combined strabismic and anisometropic amblyopia will cause more serious deficit.

Because lack of awareness and knowledge about amblyopia and its appropriate timely management is the main region behind the late presentation and significant visual impairment[6].

Amblyopic children are usually unaware of there visual deficit. Uncorrected visual deficit will cause immediate and long-term problems on life such as poor educational performance, missed employment opportunities impaired quality of life. Thus need for the screening of children to aid early detection and treatment of this condition to improve visual out come and to avoid visual disability which prevents the prevalence of life long visual morbidity.

MATERIALS AND METHODS

Study Design: Prospective observational study.

Study Subjects: Children aged between 6-16 year visiting to hospital with complaint of defective vision.

Inclusion Criteria:

- Children aged between 6-16 years.

Exclusion Criteria:

- Children who were allergic to any composition in 1% cyclopentolate or 1% homatropine solution.
- Children aged <6 years and >16 years.

Study Analysis: Data were entered in MS Excel and analysed in SPSS v20. Continuous variables were summarised as mean or median with standard deviation (SD) or interquartile range (IQR). Categorical variables were expressed as percentages with 95% confidence interval (95% CI). T test was used to test the statistical significance of difference between the groups in continuous variables. Chi square test was used test the statistical significance of deference in distribution of categorical variables.

Amblyopia was Defined as: A difference in the best corrected visual acuity (BCVA) between the two eyes of two or more Snellen lines. A best corrected visual acuity of <or equal to 6/12 bilaterally on the Snellen's chart.

Standard definitions of different subtypes of amblyopia were used for diagnosis.

Written informed consent will be taken from the study subjects or from their parents or guardians for further investigations and procedures. After explaining to

them the plan and intention of the study in their best language known to them.

In our outpatient department, a standard examination procedure was used for each study subject. Detailed history about present and past ocular problems and treatment, history of any medical or surgical treatment and family history were taken.

Collection of data is by visual tests for both near and distant vision, clinical examination of both anterior and posterior segments of the eye by slit lamp examination, fundoscopy, keratometry and A-scan biometry will be conducted. Children are then taken up to assess the refractive error under the cycloplegic effect of 1% homatropine bromide for 6-8 years and 1% cyclopentolate for 8-16 years of age, by streak retinoscopy. The appropriate glasses are prescribed after 3days of post mydriatic test. The data thus collected is analyzed. Uncorrected refractive errors are also recorded.

RESULTS AND DISCUSSIONS

Table 1: Distribution According to Amblyopia Among the Study Subjects

Type of Amblyopia	Number of children (%)	Percentage
Anisometropic	44	44%
Ametropic	24	24%
Strabismic	12	12%
Meridional	10	10%
Stimulus deprivation	8	8%
Combined	2	2%
Total	100	100%

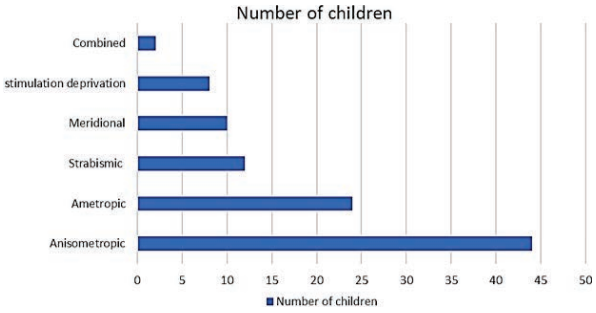

Chart 1: Types of amblyopia

Table 2: Degree of Amblyopia

Degree of amblyopia	Number of patients	Percentage
Moderate	75	75%
Severe	25	25%
Total	100	100%

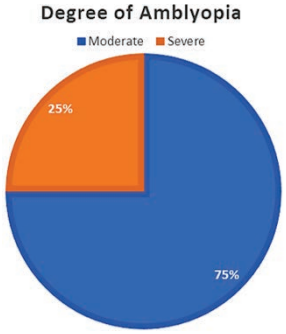

Chart 2: Degree of amblyopia

Table3: Type of Deviation (Strabismus)

Type of deviation	No. of amblyopic child	Percentage
Esotropia	15	15%
Exotropia	2	2%
Alternate esotropia	2	2%
Alternate exotropia	1	1%
Hyperopia	1	1%
Orthophoria	79	79%
Total	100	100%

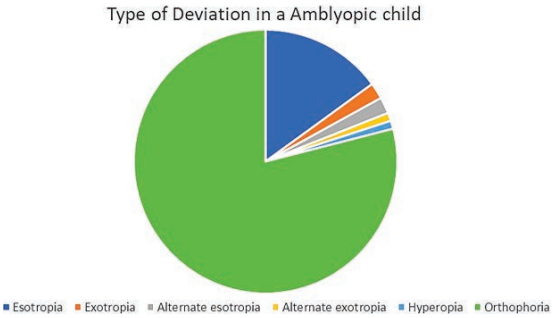

Chart 3: Type of deviation

In our study, we found that the most common amblyopia was anisometropic amblyopia (44%), followed by ametropic amblyopia (24%), strabismic amblyopia (12%), meridional amblyopia (10%) and least common was visual deprivation amblyopia (8%). In contrast to studies at Ikuomenisan SJ *et al.*, reported that anisometropic amblyopia of 78.6%[7], Daigavane S *et al.*, reported that anisometropia of 53%, followed by strabismus 23%, isometropia 15% and deprivation 8%[8]. Aldebasi YH reported that the most frequent causes of amblyopia were refractive error (94.56%) of which anisometropic amblyopia of 77.72%, Isoametropic amblyopia 16.84% and strabismus 5.44%[9] and In Abdelrazik ST *et al.*, found that anisometropia of 54.16% followed by strabismus 25%, ametropia 12.5% and finally deprivation 8.33%[10]. But in contrast to study conducted by Marthala H *et al.*, reported that strabismic amblyopia accounts for 42.50%, Anisometropic amblyopia 26.25%, meridional amblyopia 15.62%, combined amblyopia 6.25%, ametropic amblyopia 5% and stimulus deprivation amblyopia 4.37%[11].

In our study we found that many amblyopic children had moderate degree amblyopia (75%) followed by severe degree of amblyopia (25%) which was similar to study a conducted by Marthala H *et al.*, reported that 83.12% and 16.87% respectively[11].

Almost all types of amblyopia are seen in both boys and girls except visual deprivation amblyopia and combined amblyopia which was seen only in boys in our study. Most of the types of amblyopia were more common in 11-16 years age group in which anisometropic amblyopia accounting about (49.25%), ametropic amblyopia (20.9%), strabismic amblyopia (10.45%) and meridional amblyopia (11.94%) of cases. Combined amblyopia and visual deprivation amblyopia

are seen equally in both age group. P value found in this study is around 0.471 and is not significant. In contrast to another Study conducted by Ikuomenisan SJ *et al.*, reported that all the types of amblyopia were more common within the age group of 4-10 years [9-12].

CONCLUSION

Anisometropic amblyopia is the most common type amblyopia in our study and next most common type is ametropic amblyopia. Other types amblyopia noted in our study are strabismic amblyopia, meridional amblyopia and visual deprivation amblyopia. In our study most of the amblyopic cases were found between 11-16 years age group and it denotes that most of the children will have late detection.

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