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Original Research Paper

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FACTORS INFLUENCING PREVALENCE OF AMBLYOPIA IN SCHOOL GOING CHILDREN

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ABSTRACT

INTRODUCTION: Amblyopia has been defined in a variety of ways. Von Graefe, defined amblyopia as the condition in which the observer sees nothing and patient very little[1]. Clinically amblyopia has been defined as unilateral or bilateral reduction in the best-corrected visual acuity caused by form vision deprivation and /or abnormal binocular interaction, without a visible organic cause commensurate with this visual loss[2].

MATERIAL AND METHODS: A prospective study was undertaken from Dec 2012 to May 2014 at Govt schools of GVMC, Vizag. Total 8436 school going children aged between 5-15 years were screened and children whose VA < 6/12 and not improving with pin hole were included in the study. These children with poor vision were referred to Govt. REH and further examination for amblyopia was done.

RESULTS: This study was to identify the various factors influencing the prevalence of amblyopia. The study was conducted in 15 schools and a total of 8436 children were screened and 106 Children were diagnosed Amblyopic.

CONCLUSION: Amblyopia is more common in the age group of 11-13 yrs (34%) , with more prevalence in boys (54%) than girls. Anisometropic amblyopia is the commonest type of amblyopia (29%). In amblyopia caused by refractive errors, hypermetropia(65%) is common than Myopia(35%). Children even with a hypermetropia of 2-4 D developed amblyopia in majority of cases(48%) where as myopia of >6 D was responsible for amblyopia in large no. of cases (54%). Esodeviation was responsible for amblyopia than exodeviation in more no. of cases (68%). Initiation of treatment in children with amblyopia before 8 years of age yields a better prognosis.

KEYWORDS : Amblyopia, Hypermetropia, Myopia, Anisometropic amblyopia, Esodeviation, Exodeviation.

INTRODUCTION: There are no other Indian studies which have prospectively evaluated the clinical profile of different sub-types of amblyopia, be it community based or hospital based. Knowledge about the sub-types of amblyopia is important because the clinical presentations, management and outcomes of these different types are different. Both in the context of Vision 2020, with the added stress on rehabilitation of paediatric low vision, of which amblyopia is a major preventable and treatable cause[3,4,5] and the fact that untreated amblyopia is a major cause of monocular or binocular low vision in adulthood[6,7,8,9,10], with the associated deterioration in the Quality of life indices, measures for the early detection and dedicated rehabilitation of amblyopia should be taken up on a priority basis and form another tenet of the evidence-based planning that has been the hallmark of the blindness control programme in India[4,5]. A best corrected visual acuity less than 20/40 is labelled as bilateral amblyopia and a difference of two or more lines between normal and abnormal eye is required to classify it as unilateral amblyopia [11]. The amblyopia treatment study (ATS) defined amblyopia as a visual acuity of 20/40 or worse with at least a 3 log MAR line difference between the eyes[12]. Amblyopia till date remains a diagnosis of exclusion. Perhaps amblyopia is the most common cause of preventable monocular blindness and nearly all amblyopic visual loss is reversible with timely detection and appropriate intervention[13].

AIM To identify the various factors influencing the prevalence of amblyopia in school going children of age 5–15 yrs.

MATERIALS AND METHODS The study was undertaken from Dec 2012 to May 2014. The Govt schools of GVMC, Vizag were selected & screened for children with VA < 6/12 and not improving with pin hole. These children with poor vision were referred to Govt. REH & further examination like evaluation of anterior segment by slit lamp, fundus examination, retinoscopy with cyclopentolate and children with strabismus were evaluated using: Post mydriatic test, Cover test, Prism bar cover test, Krimsky test, Worth four dot test, Maddox Rod. Those children diagnosed as amblyopia were referred to orthoptics and squint clinic for necessary treatment like patching and pleoptics. The various parameters studied were age distribution, gender distribution, types of amblyopia, strabismic amblyopia, refractive errors in amblyopia, amount of hypermetropia, amount of myopia, amblyopia based on visual acuity and distribution of amblyopia in children with glasses

OBSERVATIONS The main purpose of this study was to identify the various factors influencing the prevalence of amblyopia. 15 schools of strength 8436 children were screened and 106 Children were diagnosed as Amblyopic.

1. Age distribution in amblyopia

Age	No. of Cases	%
5-7yrs	8	7
7-9 yrs	20	19
9-11	23	22
11-13	36	34
13-15	19	18

Amblyopia is more common in the age group of 11-13 yrs (34%).

2. Gender distribution in amblyopia

Age	No. of Cases	%
5-7yrs	4 (50)	4(50)
7-9 yrs	12 (60)	8 (40)
9-11	8 (25)	15 (75)
11-13	21 (51)	15 (49)
13-15	16 (81)	3 (19)

Amblyopia is more prevalent in boys (54%) than girls (46%)

3. Types of amblyopia

Type of Amblyopia	No. of cases	% of cases
Anisometropic	32	29
Strabismic	28	27
Isometropic	24	24
Meridional	8	7
Stimulus deprivation	14	13

Among the various types of amblyopia anisometropic amblyopia (29%) is the Commonest

4. Strabismic amblyopia

Type of squint	No. of cases	% of cases
Esotropia	19	68
Exotropia	9	32

Amblyopia is more prevalent in esodeviation (68%) than in exodeviation

5. Refractive errors in amblyopia

Types of Amblyopia	Hypermetropes	Myopes
Anisometropic	19 (57%)	13(43%)
Isometropic	16(65%)	8(35%)
Meridional	5(72.5%)	3(27.5%)

Amblyopia is more common in Hypermetropia (65 %) than myopia

6. Amount of hypermetropia

Dioptric power	No. of Cases	% of cases
2-4 D	18	48
4-6 D	12	26
6-8 D	8	21
8-10 D	2	5

Hypermetropia of 2-4D was responsible for amblyopia in more no of cases (48%)

7. Amount of myopia]

Dioptres	No. of Cases	% of cases
2-4 D	5	21
4-6 D	6	25
>6D	12	54

Myopia of >6D is responsible for amblyopia in large percentage of cases (54%)

8. Amblyopia based on visual acuity

BCVA	No. of cases	% of cases
6/12- 6/24	52	49
6/36- 6/60	31	29
>6/60	23	22

Majority of children had a visual acuity of 6/12- 6/18 (49%)

9. Distribution of amblyopia in children with glasses

Amblyopia caused by refractive errors in 64cases. Only 26% of amblyopic children were using glasses.

PGP	No. of cases	% of cases
YES	16	26
NO	48	74

RESULTS

The main purpose of this study was to identify the various factors influencing the prevalence of amblyopia. 15 schools of strength 8436 children were screened and 106 Children were diagnosed as Amblyopic.

Age distribution in Amblyopia: Amblyopia is more common in the age group of 11-13 yrs (34%).Mean Age is 10.72 years with SD = 2.38 yrs

Gender distribution in Amblyopia: Amblyopia is more prevalent in boys(54%) than girls (46%)

Types of Amblyopia : The most common type of amblyopia is anisometropic(29%) followed by strabismic (27%) , isometropic (24%) , stimulus deprivation (13%) and meridional (7%)**.** Amblyopia is more prevalent in esodeviation (68%) than in exodeviation.

Refractive Errors in Amblyopia: Amblyopia is more common in Hypermetropia (65 %) than myopia (35%)

Amount of Hypermetropia &Myopia: A hypermetropic power of even 2-4 D is responsible for amblyopia in majority of cases (48%)whereas a myopic power of >6 D is responsible for most of the cases of amblyopia

Amblyopia based on Visual Acuity: Most of the children with amblyopia had a visual acuity of 6/12 –6/18 (49%)

Distribution of Amblyopia in Children with Glasses Amblyopia caused by refractive errors in 64cases, 0nly 26% of amblyopic children were using glasses.

DISCUSSION

In the present study 106 children with amblyopia were identified from a population of 8436 school going children of 5-15 yrs.
In this study prevalence of amblyopia is 1.32%, which was close to the prevalence of amblyopia in other study of visual impairment in school children in southern India by Ganekal S, Jhanji v and etal(1.1%)[14].

The mean age of presentation is 10.72 yrs S.D of 2.38 yrs correlating with the average age of presentation in a study by 'Prevalence and Profile of Amblyopia in Children at Bharatpur Eye Hospital'[15],

Amblyopia was more prevalent in boys (54%) than girls (46%) similar to that obtained in Profile of amblyopia in a hospital referral practice by RP centre AIIMS New Delhi which was 373 male (54.61%) and 310 female (45.38%) patients[16].

The most common type of amblyopia is anisometropic followed by strabismic, isometropic, stimulus deprivation and meridional. But in various hospital based studies -Profile of amblyopia in a hospital referral practice by Vimla Menon_et al RP centre AIIMS New Delhi strabismic amblyopia was the most common type followed by anisometropic amblyopia. This might be because of the small sample in our study and our study was a community based, while their study was hospital based and there is late presentation of amblyopia to hospitals. Strabismic amblyopia is more common in Esodeviation(68%) than in Exodeviation.

Out of the refractive errors causing amblyopia, hypermetropia (65%) is common compared to myopia. A hypermetropic power of even 2-4 D is responsible for amblyopia in majority of cases (48%) whereas a myopic power of >6 D is responsible for most of the cases of amblyopia (54%)[17].

Most of the children with amblyopia had a visual acuity of 6/12 –6/18 (49%).Out of 64 children with refractive errors causing amblyopia 16 were using glasses and the rest were not, indicating that amblyopia is more prevalent in children not using glasses.

CONCLUSIONS

Amblyopia is more common in the age group of 11-13 yrs(34%) , with more prevalence in boys (54%) than girls. Anisometropic amblyopia is the commonest type of amblyopia (29%).In amblyopia caused by refractive errors, hypermetropia(65%) is common than Myopia(35%).Children even with a hypermetropia of 2-4 D developed amblyopia in majority of cases(48%) where as myopia of >6 D was responsible for amblyopia in large no. of cases (54%).Esodeviation was responsible for amblyopia than exodeviation in more no. of cases (68%).Making early diagnosis before the age of 8 years aids in the treatment of amblyopia .

RECOMMENDATIONS:

School surveys should be conducted to screen primary school children with refractive errors and strabismus for early detection and management of amblyopia. Even dropouts and children out of school should be identified and screened for refractive errors.Teachers and Parents should be educated regarding early detection of refractive errors and compulsory usage of spectacles by the children.

Teachers should be advised to identify the children with defective vision by shuffling of rows.Children with poor performance while copying from blackboard should be screened for refractive errors and advised frequent ophthalmic examination. Children with anisometropia should be identified and treated early as late detection can lead to permanent amblyopia and development of strabismus.

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