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Does Amblyopia Cause Disability in School Children

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ABSTRACT

The main aim is to determine “Does amblyopia cause any functional and academic disability in school going children?”. Prospective Questionnaire based study.

All the children who were diagnosed with Amblyopia in L.V Prasad Eye Institute, Hyderabad with a visual impairment of one eye and normal vision in fellow eye. The children who are undergoing treatment or treated by patching or glasses were included in the study. The appropriate sample size of 30 subjects was determined and questionnaire was given to the children who were undergoing treatment and came for follow up in L.V Prasad Eye Institute. The age group of the study sample was 8-16 years who were diagnosed as strabismus and/or anisometropic amblyopia, the given questionnaire was filled by the child and returned back to the investigator. The questionnaire was administered to children who were under treatment at any point of time. No functionally or clinically significant differences observed in children with amblyopia in various subscales. On an average, results for the various subscales show that for most of the questions, a favorable response was obtained. Internal Consistency reliability (Cronbach α) of various subscales ranged from 0.52 to 0.96. Mean of all the 29 items ranged from 0.50 to 4.96 with 70% of the mean items is above 4.0 and 20% of the mean is above 3.0, which has shown that maximum items had favorable response. There was no adverse effect observed in academic performance with 70% of students fall in level 2 i.e. obtaining more than 50% and less than 75% marks in their examinations. On an average, results for the various questions and subscales show that for most of the questions there was a favorable response suggesting that the amblyopia does not cause much disability and children can compete with their peers.

Keywords: Amblyopia, disability and school children.

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INTRODUCTION

Amblyopia is the most common cause of reduced vision in children and young people, with significant cost to both the individual and community in terms of screening and treatment [1]. Amblyopia result from abnormal development of the visual system and affects approximately three percentage of the adult population [2, 3]. Clinically amblyopia is diagnosed when there is a difference in visual acuity between the eyes of two lines or more, a pre-disposing amblyogenic condition is present, and there is no sign of visible ocular or visual pathway disease. Amblyopia is usually classified according to the underlying cause, which, most commonly, are strabismus (misalignment of the yes), anisometropia (significant difference in refractive error between two eyes), or form deprivation (presence of media opacity such as cataract). These conditions create monocular blur or ocular misalignments, which if present during the critical period of visual development.(up to about 7yrs of age) [4] , can lead to loss or rearrangement of neural connections within the visual cortex [5,6]. Amblyopia is a disorder of development of the visual system that can present with varying levels of severity and usually affects only one eye only, the entire non amblyopic eye often has array of small but measurable deficits [7]. Amblyopia is often considered to be a childhood condition as this is when it is most often diagnosed and treated. Thus clinicians need to know which life skills relevant to a child may be affected if amblyopia is left untreated and be aware of any functional difficulties that a child may experience during and following the treatment. Previous studies has been reported that disability associated with amblyopia expressed by at least sixty four percentages of parents of amblyopic children have been reported to express concerns regarding disability associated with amblyopia. Parents of children with early diagnosis (before five years of age) were more likely to consider amblyopia a very serious problem (58% Vs 69%), while parents of children with late diagnosis frequently reported that their child had problems attributed to amblyopia (80% vs. 64%). Reported problems were typically those of school performance rather than related to social or athletic activities [8]. Few studies reported, on a semi structured interviews on a small number of parents of children with amblyopia (n=1) have concluded that these parents did not regard amblyopia as a disabling condition, with little impact on career choice or motor function. This study also reports that practitioners who treat amblyopia generally agree that amblyopia may limit career choices due to visual standards; hence there is a need to promote maximum vision in each eye to decrease life time risk of visual impairment [9].

MATERIALS AND METHODS

All the subjects were recruited from the department of pediatric ophthalmology, strabismus and neuro ophthalmology, children eye care center (CECC) department, L.V Prasad Eye Institute, KAR campus, Banjara Hills, Hyderabad, with age group between eight to sixteen years and children who were diagnosed with amblyopia and who were undergoing treatment also included in the particular study. Before administering the questionnaire, written informed consent was obtained from the parents of every child who participated in the study. Study protocol, questionnaire and consent form were approved by the institution review board of the L.V Prasad Eye institute. Inclusion criteria of the study are children who were diagnosed with unilateral amblyopia (Strabismic/ Ametropia/ anisometropia, or combination) and those undergoing treatment. Children who were bilateral amblyopes, intellectually challenged, nerve

palsy and poor visual acuity in both eyes were excluded from the study. Questionnaire comprises of twenty nine items which used in this study adapted from the amblyopia and strabismus questionnaire [10]. Questionnaire is administered to the child who can assess themselves with a set of twenty nine questions and each question comprises of five options except question number seven and nine which has two and three options respectively and each of which is given a score according to options chosen. The first page of the questionnaire contains the demographic information of the subjects like (Name, class, gender, date of birth, address, school name). The back sheet of the questionnaire contains the S.no, MR. No., diagnosis, score, the sign and details of the investigator. The questionnaire Contains 29 items organized into six domains: (1) fear of losing better eye, (2) distance estimation (3) visual disorientation, (4) double vision, (5) classroom ergonomics and (6) social contact and appearance. All items are measured on linkert-type rating scale. For the purpose of scoring, the rating scales are assumed to be linear and run from 5 to 1, where 5 corresponds to the most favorable and 1 correspond to least favorable. Intermediate response options are assigned a proportionate score. It is thus assumed that the response options are positioned at equal distance on the scale. A five option item thus has possible scores of 5, 4,3,2,1 ranging from favorable to unfavorable. Most items have 5 response options, but 2 items have 2 and 3 options respectively. In those cases a possible score is 5, 2.5 and 0. All participants completed the questionnaire in unsupervised manner in the waiting room assuming normal conditions when they see with two eyes and wearing glasses. For each participant, best corrected visual acuity and diagnosis were extracted from the medical record. Unilateral visual acuity loss was categorized on a 4-point scale: Level 1, interocular difference in visual acuity less than or equal to 1 line, Level 2, interocular acuity difference of 2 to 4 lines, Level 3, interocular acuity difference of 5 to 7 lines and Level 4, interocular acuity difference of greater than 8 lines. Percentage of marks obtained by the child in the school exams was categorized on a 4 point scale: Level 1, more than 75%, Level 2, more than 50% but less than 75%, Level 3, more than 30% but less than 50% and Level 4, less than 30% accordingly.

RESULTS

After the calculation of sample size, data was entered in the Microsoft excel sheet. The data Collected was analyzed into total score by the subjects and their sub scales. Mean and the standard deviation have been calculated for the total score and the sub scales from data analysis package of excel 2010. Overall analysis was done for different questions and subscales. Properties of the questionnaire were assessed by determining Cronbach alpha coefficient for internal consistency reliability for each subscale [11]. On an average, result for the various questions and subscales show that for most of the questions there was a favorable response suggesting that the amblyopia does not cause much disability and children with amblyopia can compete with their peers. A total of 30 subjects were included in the study. Out of which, 17 are boys and 13 are girls with a mean age of 10 years.

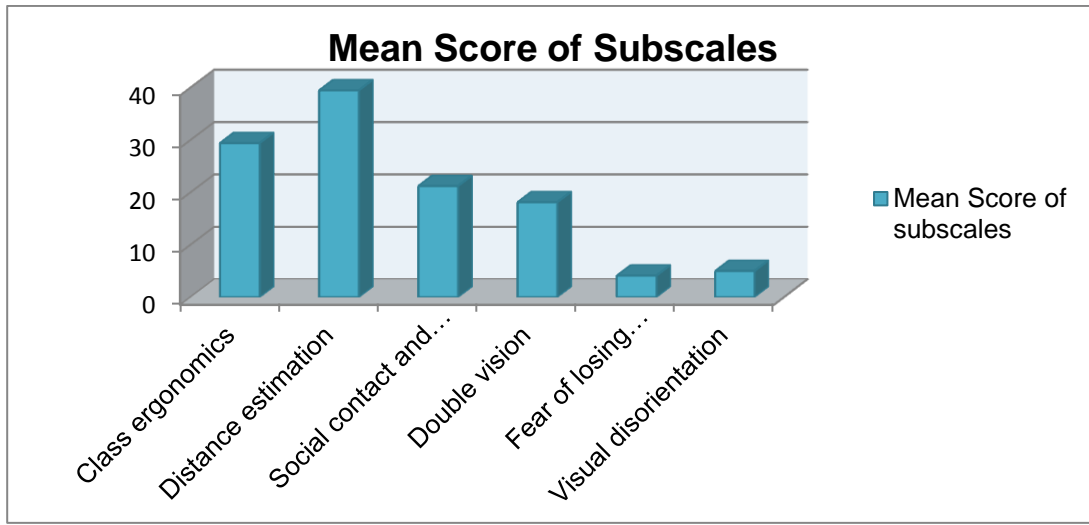


Figure1: Indicates the mean score of the entire subject in different subscales

Table 1: Cronbach α Coefficient of number of items Vs internal consistency reliability.

This Table shows internal consistence reliability of all the subscales which shows good reliability with all the Cronbach α value is close to 7 or greater except for the subscale fear of losing better eye.

For the subscale visual disorientation Cronbach α is not possible as the number of items in this subscale is 1

Subscale	No. of Items	Internal consistency reliability
Class Ergonomics	8	0.785
Distance estimation	9	0.685
Double vision	4	0.69
Social contact and appearance	5	0.96
Fear of losing better eye	2	0.52

Table 2: Show good reliability of mean and standard deviation.

S.no	Questions	Mean (SD)
1.	My handwriting is	3.36 (± 0.76)
2.	I have difficulty in reading the text	3.73 (± 1.01)
3.	I have difficulty to write on a line in notebook	4.23 (± 0.93)
4.	In classroom I see blackboard more clearly if I sit in	1.9 (± 0.95)
5.	I would be more comfortable to copy from my friends sitting beside me rather than to copy from blackboard	4.03 (± 0.92)
6.	I Have difficulty to see in less illumination	4.06 (± 0.98)
7.	I can see equally well with both the eyes	0.5 (± 1.52)
8.	I worry about losing my better eye	3.76 (± 1.19)
9.	I can estimate distance well	3.16 (± 1.30)
10.	I have difficulty to see letters on the blackboard	3.5 (± 1.13)
11.	I have good depth perception	3.86 (± 0.68)
12.	I feel unsure or hesitant when putting something on table	4.4 (± 0.85)
13.	I miss the other persons hand when try to shake hands	4.7 (± 0.65)
14.	I have difficulty in drawing and coloring the picture	4.6 (± 0.67)
15.	I find it difficult to put the cap on a pen or marker	4.76 (± 0.50)
16.	I find it difficult to put a power plug into a socket	4.83 (± 0.37)

17.	I have difficulty pouring drinks	4.90 (± 0.30)
18.	I have difficulty walking down stairs	4.75 (± 0.52)
19.	I have difficulty playing ball games	4.13 (± 0.77)
20.	I have difficulties finding my way in a department store or	4.86 (± 0.43)
21.	I see double	4.36 (± 0.88)
22.	Double vision disturbs me in my daily activities (study, school, hobbies and work)	4.73 (± 0.58)
23	When I am tired, I must be careful not to miss what I reach for	4.6 (± 0.62)
24	have to do things more slowly when I am tired because of my eyesight	4.43 (± 0.93)
25	I have difficulty making eye contact in one-on-one conversation	4.3 (± 1.02)
26	I have difficulty making eye contact with people in group conversation	4.36 (± 0.99)
27	My eyes are misaligned (one or both eyes cross, or turn out, or turn up)	4.3(± 1.18)
28	Because of my misaligned eyes I feel insecure	4.43(± 1.04)
29	If I did not have misaligned eyes, I would have more self confidence	4.6(± 1.26)

DISCUSSION

The main intention of the study was to find out whether children with amblyopia find any difficulty to compete with their peers in various activities through a set of 29-item questionnaire which focuses on six domains. The data presented was obtained from children who were diagnosed with amblyopia and visual acuity of 20/60 or better in at least one eye and age group of 8-16 years with mean age of 10 years. Subscales show good internal consistency reliability except for the subscale fear of losing better eye. This study represents the first attempt to quantify does amblyopia cause any disability in school going children of age group 8-16 years. Our study addressed questions directed towards experience of the child in doing day to day activities which are organized into 6 domains: (1) Class ergonomics, (2) Distance estimation, (3) Social contact and appearance, (4) Double vision, (5) Fear of losing Better Eye, and (6) Visual disorientation. Our study found that there was not much statistically significant disability caused due to amblyopia on their daily activities and studies. Data collected shows the response towards the favorable side and we observed that mean for the maximum item (70%) is above 4 which suggest that children don't find much difficulty in competing with their peers. It also suggests that the children with amblyopia find a little difficulty in class ergonomics as the item in subscale shows the mean value of less than 4.0 and most children prefer to sit in first row as the mean value show 1.9, directing towards unfavorable condition. This study also showed that there were no adverse effects in academic performance as 70% of the children fall in level 2 i.e., more than 50% but less than 75%. This study is well powered to assess does amblyopia cause disability in school children although we cannot rule out the possibility that a small disturbance would have been missed out.



CONCLUSION

Results for the various questions and subscales show that for most of the questions there was a favorable response suggesting that the amblyopia does not cause much disability and children can compete with their peers.

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