ORIGINAL ARTICLE

ASSESSMENT OF COMPLIANCE IN CHILDREN (0-16YEARS) USING LOW VISION AIDS

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ABSTRACT

Aim: To check the compliance in paediatric population using low vision aids (children aged 0-16 years from blind schools and paediatric patients visiting the low vision department of a tertiary eye care centre) and thereby its impact on their QOL.

Methodology: In this cross-sectional study a total of 113 children with low vision, from blind schools and tertiary eye care centre in Pune were assessed between October 1st 2007 and October 1st 2008. A complete low vision examination was done and appropriate aids were provided. Next follow up date was given to the patient: first at 3 months and second at 9 months from the first assessment. At each visit, the compliance and change in the QOL were assessed. Examination included an ophthalmologic work up, assessment of BCVA. The children were administered a questionnaire to assess the use and satisfaction with the device in the interim period. The QOL was assessed on the basis of the changes noticed in mobility, recognition and other outdoor, routine and vocational activities.

Results: Out of 314 children from the schools for blind, 19.10% were found to have low vision.In schools for blind: Out of initial 60 children with low vision, 83.3% children were present during the second follow up and 66.7% were using the aid. Only 8.33% broke their aids while 3.3% found it difficult to use the aid, 10% left the aid somewhere. In tertiary eye care centre: Out of the 53, 62.3% were present and 58.5% were usingthe aid. Thus, at the second follow up more number of children from tertiary eye care centre were found using the aids. With the use of aids 61.7 from the schools for blind and 52.8% from the tertiary eye care centre were independent in their mobility.

Conclusions: Compliance, as measured in terms of attendance and regular usage of aids provided, along with improvement in routine and outdoor activities proves the beneficial change noticed in the QOL at an individual level by the children with low vision. It was very heartening to note that improvement in craft work was seen, which assures a very good future for them in getting vocationally settled in life by betterment in these activities.

Key words: QOL: quality of life, BCVA: best corrected visual acuity,LVA: low vision aids. Pune

INTRODUCTION

Low vision has come in limelight with the global initiative, "VISION 2020: Right to sight" also takingsteps to ensure management of low vision.[1] A recent population based study has shown the prevalence of low vision to be 1.05% in India.[2] India has 407 million children below the age of 16 years. This accounts for 40% of the Indian population.[3] Due to the expected number of years lived in blindness (blind years), childhood blindness remains a significant problem, with an estimated 1.4 million blind children below age 15. Visual impairment is not distributed uniformly throughout the world. It has been observed that almost 90% of those considered blind, retain a degree of potentially useful residual vision.[4] Children with low vision need good assessment and training to use low vision aids with regular follow ups to ensure good compliance. An important part of evaluation includes counseling of the patient as well as family members apart from just dispensing the aids .The low vision child is slowly made to accept the fact that vision is not going to improve beyond a certain level. However, he may still be able to continue his routine lifestyle with some training and the aid of certain devices that optimizes the vision that he continues to have. Follow up, rehabilitation and satisfaction with various low vision aids are also important. Thus,these aids are a major factor in improving the quality of life.

METHODOLOGY

This is a cross-sectional study carried out during the period of October 1st 2007 to October 1st 2008 in children. Sample was collected from pediatric outpatient department of a tertiary eye care centre, Pune and four schools for blind children from the state of Maharashtra namely Dhule girls blind school, Dhule boys blind school, Dhamdod blind school, Nandurbar and Manchve blind school, Pune. The required permission for screening of the children was obtained from the principal/headmaster of the schools. UNICEF defines childhood as 0 to 16 years inclusive. All children were screened from the blind schools and children with low vision were included in the study. Out of all children examined during October 1st 2007 to October 1st 2008, those with low vision were enrolled in the study. Any children with mental retardation or multihandicap and those above 16 years of age were not taken in the study.

The entire low vision examination was done by the same team formed by a single ophthalmologist and two optometrists. Brief demographic details and complete history was recorded. The need of each child was clearly evaluated and discussed. The information regarding child's literacy was noted. A child who could at least read and write his name in the local language / in Braille was considered literate. Thus, a note of the literacy media was also made i.e. print or Braille. Mobility of every child was observed by the team and the children were also asked about their problems in mobility.

Children who could move around without any support, without bumping into objects in the way were considered independent whereas those who could not were taken as dependent. Leading questions were asked regarding the needs of lighting in the room and any problem/photophobia in sunlight. Case record included the anatomical classification of causes/determinants of blindness as given in the WHO prevention of blindness program's (WHO/PBL) eye examination record for children with blindness and low vision along with the entire low vision assessment, prescription of low vision devices. The working defination of low vision used was as given by WHO in 1992 at Bangkok.[5] Complete visual assessment was done. Visual acuity was tested using the Lea symbol charts for near and distance. Similarly, the near vision was also recorded and the testing distance was measured using a ruler. Then, contrast sensitivity was assessed using Lea symbols low contrast flip chart. Appropriate aids optical (for near and distance) and non optical were tried with more stress on the activity of interest and finally prescribed. As per the retinoscopic results distance correction spectacles for myopia or hypermetropia were prescribed. While prescribing a telescope, the amount of magnification given was assessed depending on the child's best visual acuity and the target acuity. Thus, the amount of magnification needed was determined by the following formula: Magnification = Best visual acuity / Target acuity .For near: Kestenbaum method was used.

Criteria for the advocacy of prescribing devices: Any device was prescribed to a child only if there was demonstrable improvement on the functional assessment objectively, i.e. the child benefits in the way of final acuity or working distances as compared to the existing conditions, even with marginal functional benefit; Or Subjective improvement was found by the child with the use of these devices and was motivated for their use.

The use of the prescribed device was demonstrated and children were taught to use it before dispensing in order to ensure good compliance. Instructions regarding the do's and don'ts were given with the aid as handouts in the local language when the trial was over. These handouts also contained instructions about the needed environmental modifications eg seating arrangement in the class room. Next follow up date was given to the patient: first at 3 months and second at 9 months from the first assessment / visit.

Two follow up examinations were done at three months and nine months from the first examination. At each visit the compliance and change in the quality of life of these children was assessed. Examination included a general complete ophthalmologic work up, and the children were administered a Questionnaire to assess the use and satisfaction with the device in the interim period. Direct questions were asked regarding the use of the device provided and the reasons for not using as well. The quality of life was assessed on the basis of the changes noticed in mobility, recognition and other outdoor and routine activities. Additional/ new activities which the children started performing after using the devices provided were also noted. The data were entered into a database and analyzed using SPSS (statistical package for social sciences), version 10.0 statistical software for Windows. Chi square test was applied wherever significant.

RESULTS

In schools for blind, Out of initial 60 children with low vision, 44 (73.3%) children were present during the second follow up and 21.7% were using the aid as advised. In tertiary eye care centre, Out of the 53 children with low vision, 36 (67.9%) were present for the second follow up and 66% were usingthe aid as advised. Thus, at the second follow up more number of children from tertiary eye care centre were found using the aids. At first follow up, Out of 60 children from schools for blind who were given aids, only

8.33% broke their aids while 2 (3.3%) found it difficult to use the aid, 6 (10%) left the aid somewhere. This suggests that only 8 children probably did not appreciate any significant improvement in their activities over a longer period (9 months from first examination) with the aids. With the use of aids provided 37 (61.7%) of the initial 60 children with low vision from the schools for blind and 28 of the 53 (52.8%) from the tertiary eye care centre were independent in their mobility. Out of 60, 35 children from schools for blind and 19 of 53 from tertiary eye care centre could comfortably play outdoors. 5% children from schools for blind and 7.5 % from the tertiary eye care centre could cross the roads independently with their aids. [Table 1]

At second follow up, 73.3% children were present during the second follow up in schools for blind and 21.7% out of 60 were using the aid as advised. 67.9% children from the tertiary eye care centre were present for the second follow upand 66% were using the aid as advised. [Table 2]

All children from both groups were dependent in their mobility but with the use of aids provided 29% from the schools for blind and 31% from the tertiary eye care centre were independent. 30 % children from schools for blind and 35.8% from tertiary eye care centre could comfortably play outdoors.5% children from schools for blind and 7.5 % from the tertiary eye care centre could cross the roads independently with their aids.

At second follow up 23.3% children from the schools for blind could read and write.48.3% had better recognition of faces and objects at 3m and could wash; maintain their clothes better. In tertiary eye care centre 50.9% children were found to be able to read and write.62.3% had better recognition of faces and objects at 3m and could wash; maintain their clothes better.

46.7% children from the schools from blind and 60.4% from the tertiary eye care centre noticed significant improvement in the craft work. With the aids these children could perform routine activities, near and distance activities like opening the cupboard with a key, seeing time on the wrist watch, walking independently etc. One child from the blind school could now see the numbers on the state transport buses. Another child from the tertiary eye care centre noticed improvement in writing on a line.

Table 1: Comparison of child before intervention and after intervention

Type of Population	Mobility			Playing Outdoors		Crossing Road Independently	
	Mobility	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Blind school	Dependent	60 (100)	13 (21.66)	0	35 (58.3)	0	3 (5.0)
	Independent	0	37 (61.7)				
Tertiary Eye Care Centre	Dependent	53 (100)	5 (9.43)	0	19 (35.8)	0	4 (7.5)
	Independent	0	28 (52.8)				

Figure in parenthesis indicate percentage.

Table 2: Number of children present during examination and using the aid provided

Type of Population	Children using Aid	Children not using Aid	Total
Blind school	31 (51.7)	13 (21.7)	44 (73.3)
Tertiary Eye Care Centre	35 (66)	1 (1.9)	36 (67.9)

Table 3: Outdoor Activities

Type of Population	Mobility	Mobility		Playing Outdoors		Crossing Road Independently	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention\
Blind school	Dependent	60 (100)	15 (25)	0	30 (50.0)	0	3 (5)
	Independent	0	29 (48.3)				
Tertiary Eye Care Centre	Dependent	53 (100)	5 (9.43)	0	19 (35.8)	0	4 (7.5)
	Independent	0	31 (58.49)				

Figure in parenthesis indicate percentage.

Table 4: Indoor /Routine Activities

Type of population	Read		Write		Recognizing at 3m after intervention	Washing & Maintaining clothes
	Before intervention	After intervention	Before intervention	After intervention		
Blind school	0	14 (23.3)	0	14 (23.3)	29 (48.3)	29 (48.3)
Tertiary eye care centre	0	27 (50.9)	0	27 (50.9)	33 (62.3)	33 (62.3)

Figure in parenthesis indicate percentage.

Table 5: Craft Work

Type of population	After intervention
Blind school	
Better (Recognizing at 3m)	28 (46.7)
No improvement	16 (26.7)
Tertiary eye care centre	
Better (Recognizing at 3m)	32 (60.4)
No improvement	04 (07.5)

Figure in parenthesis indicate percentage.

DISCUSSION

Low vision has a vicious cycle of impact. These children have inappropriate/ineffective actions and interactions with their physical and social world. Hence, they have lack of feedback from their immediate world leading to limited/distorted information. The impact extends beyond functional problems to a myriad of psychological issues ranging from grieving the loss of sight to the impact of loss on the family and significant others. Because of this it is important for children with low vision to experience their world as much a possible and to receive aids to help them make connections between objects and processes.More so in children as early management and provision of aids will help them cope with their daily needs, social and educational needs as well. This will enhance their performance in school and develop their self confidence. Thus, with the low vision aids these children would be able to overcome the emotional impact as well. This will help in their social acceptance and thus enlighten their dark world.In this study, the compliance in terms of follow up rate was good in 83.3% and 62.3% from the schools for blind and tertiary eye care center respectively. These children were not only present during the first follow up but 66.7 %; 58.5 % from the two groups respectively were also using the aids provided. This indicates the satisfaction and improvement in quality of life of these children. Independence in mobility was seen in almost all the children using the aids regularly. Good improvement was observed in the outdoor activities and routine activities as well. Significant improvement in the craft work was also noted. Thus, verifying the fact that most of the children have a perceivable benefit as shown in studies by. Similar results regarding satisfaction with low vision aids was seen in the study by Rohrschneider K et al[6]. In the second follow up 51.7% children from the schools for blind and 66% children from tertiary eye care center were found to be using the aids regularly. The decline in the percentage of children using aids in the blind schools whereas increase in the second study group probably indicates that over the longer period of time more attention was paid to the children in tertiary eye care center. This also implies that needs of children in schools for blind may have been neglected by teachers/guardians whereas in the second group it was the parents / close relatives who were taking care and were more cautious. Compliance as measured in terms of attendance [83.3%, 62.3%] and regular usage of aids provided [66.7%, 58.5%] along with improvement in routine and outdoor activities proves the beneficial change noticed in the quality of life at an individual level by the children with low vision.

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