



LOW VISION DEVICES; VISUAL OUTCOME AMONG POPULATION OF DERA GHAZI KHAN, SOUTHERN PUNJAB, PAKISTAN

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ABSTRACT... Objective: The main objective of the present study was to find out visual outcome of Low Vision Devices among patients suffering from different diseases causing reduced visual acuity in the area of Dera Ghazi Khan, Southern Punjab, Pakistan. **Setting:** Ophthalmology Department, Dera Ghazi Khan which is a tertiary care hospital. **Period:** 10th February, 2014 to 31st December, 2014. **Material and Methods:** Patients (n=55) presented for their low vision assessment included two groups age wise as patients equal or more than 18 years age (n=22) and patients less than 18 years (n=33). LOG MAR VA charts, contrast sensitivity test, visual fields through arc perimeters, color vision with color pencils hue 16 test along with objective and subjective refractions were applied. All the data were entered and analyzed using SPSS version 16.00. **Results:** Patients (n=55) aged 7-90 years presented for their low vision assessment had mean age 23.73+ 2.9 years. The patients were divided into two age groups. First group was 22 (40%) patients equal or more than 18 years age and second consisted of 33(60%) patients less than 18 years age group. Among the patients examined, 40 (72.7%) were males and 15 (27.3%) were females. Our study results revealed that the low vision devices provision was associated with a statistically significant improvement in both near and distance visual acuities and with patients' fulfillment. **Conclusion:** There was a significant improvement in far and near visual acuity of the patients suffering from a multiplicity of blindness caused diseases by which patients are able to improve their quality of life and able to do their tasks without getting help from others.

Key words: Low Vision Aids (LVAs), Visual Acuity (VA), Near Visual Acuity (NVA), Logarithm of the Minimum Angle of Resolution (LOG MAR)

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INTRODUCTION

The visually impaired patients, irrespective of the age, which can no longer be managed by traditional optical, medical or surgical procedures are increasing in daily practice both in developed and developing countries and have posed major challenges to optometrists and ophthalmologists.¹

There is no ultimate treatment for the causes of visual problems including "age-related macular degeneration (AMD), diabetic retinopathy and/or glaucoma" which are found to be effective in delaying/preventing deteriorating impacts of such impairments on vision.^{2,3,4} There is a noteworthy entity, public health and community outcomes of reduced vision, such as boosted cost of education, decreased personal income and loss of productivity for those caring for the visually impaired.⁵

To lessen the degree of handicap related with visual problems by providing low vision aids (LVAs) as a part of a comprehensive low vision rehabilitative service is the most efficient mode.⁶ When employed properly, these devices can improve residual visionary outcomes and can allow general public having impaired sight to perform their daily duties such as reading and other physical activities like sports.^{3,7} The outcome of low vision devices depends on enhancing the job of low vision provider from prescribing LVAs, into counseling and training low vision patients.^{6,8}

The childhood blindness has power over a priority of "Vision 2020 - the right to sight", world goal for the abolition of avoidable blindness.⁹ Many proposals are reorganized for the importance of

providing care for children with low vision, such as Vision 2020, the 2004 Oslo Workshop on low vision and the United Nation's global campaign - 'Education for All'.¹⁰

Visually impaired children especially with hereditary/congenital ocular anomalies has advantage from accurate refraction and low vision services which smooth the progress of vision enhancement and inclusive education in these children.¹¹

WHO definition for low vision "(6/60 < VA < 6/18, 10° < VF < 20°), 10 severe vision impairment (3/60 < VA < 6/60, 5° < VF < 10°), and blindness or profound vision impairment (VA < 3/60, VF < 5°)" are considered reliable.¹²

In Pakistan, the reported proportion of functional FLV and total blindness is observed to be 1.7% and 0.2% respectively. In Pakistan, there is a need to do planning to measure the magnitude of the problem with the demographic distribution as well as educational status of the persons affected.¹³

In underdeveloped countries like Pakistan, lack of knowledge of healthcare professionals regarding availability of such services poses challenges in the practice of Ophthalmology. Moreover, in Pakistan there are no effective national health insurance policies which can harbor higher costs of LVAs.

MATERIALS AND METHODS

This study was conducted in ophthalmology department, Teaching hospital, Dera Ghazi Khan from 10th February, 2014 to 31st December, 2014. Data of 55 Patients presented for their low vision assessment was collected. The patients suffering from different diseases causing the reduction of the visual acuity were divided in to two groups age wise as patients equal or more than 18 years age (n=22) and patients less than 18 years (n=33) age group. Among the patients examined, 40 were males and 15 were females.

In all the patients standard protocol Performa was followed for the assessment of each patient that contained, patient's history, visual acuity (unaid-

ed and aided), near visual acuity (aided and unaided) through logarithm of the minimum angle of resolution (LOG MAR) VA charts, contrast sensitivity test, visual fields through arc perimeters, color vision with color pencils hue 16 test along with objective and subjective refractions by single ophthalmologist and refractionist. In all the patients slit lamp examination of anterior segment and also posterior segment was done to diagnose different diseases causing reduced visual acuity. The low vision devices for far including telescopes (power ranging from 2.5x to 8x) magnifiers for near including stand magnifiers, hand held magnifiers, electronic devices including CCTV magnifiers and typoscopes, noins, filters were advised and environmental modifications as a part of additional advices.

Statistical analysis was done using computer program SPSS version 16.00. Mean and standard deviations have been calculated for numerical data while frequencies and percentages were tabulated for categorical study variables. Follow up period of these study cases was one month.

RESULTS

This study was conducted in ophthalmology department, teaching hospital, Dera Ghazi Khan from 10th February, 2014 to 31st December, 2014. Patients (n=55) aged 7-90 years presented for their low vision assessment. Mean age was 23.73+ 2.9 years. The patients were divided into two age groups. First group was 22 (40%) patients equal or more than 18 years age and second consisted of 33(60%) patients less than 18 years age group as shown in Table I. Among the patients examined, 40 (72.7%) were males and 15 (27.3%) were females as in Table II.

Tables 3,4,5 demonstrated that 17 male adult patients (30.90%) were diagnosed as with 5 retinitis pigmentosa, 3 maculopathy, 1 nystagmus, 2 glaucoma, 2 corneal opacities, 2 bilateral (B/L) amblyopia, 1 myopic degeneration and 1 albinism. 10 patients out of them had unaided far vision less than 1.0 log Mar to finger counting and remaining 7 had more than 1.0 log Mar to 0.5 log Mar. 12 patients had unaided near vision was less

than 4M and 5 had more than 4M. 13 patients got their vision improved with the help of low vision devices prescribed to them 0.2 to 0.8 Log Mar and 1.25 to 1Mar for near respectively. Referrals to education and rehabilitation services were 4 who unable to get improvement in their through low vision devices.

23 male child patients were diagnosed as with 6 retinitis pigmentosa, 5 maculopathy, 2 nystagmus, 2 glaucoma, 2 corneal Opacities, 3 myopic degeneration, 1 albinism and 2 optic Atrophy. 15 patients had the vision less than 4M 11 had more than 1.0 log Mar to 0.5 Log Mar, similarly 12 patients had near vision less than 4M, 11 had more than 4M. 20 of them got their far vision improved through low vision gadgets to 0.1 to 0.9 log Mar and near vision to 1M, 1 child suffering from corneal opacity didn't improved but got his near vision to 1M by using CCTV magnifier. 2 children were referred to special education center for blind for education and rehabilitation services.

There were 5 female adult patients who were presented with 2 retinitis pigmentosa, 1 nystagmus, 1 glaucoma and 1 corneal opacities. 3 patients had visual acuity less than 1.0 log Mar to finger counting and 2 had more than 1.0 to 0.5 Log Mar, similarly 4 patients had near vision less than 4M and 1 had more than 4M. 3 of them got improved by applying low vision devices, 1 did not get improved for far vision but near vision improved to 1M like 4 others and 1 was referred for rehabilitation services for orientation and mobility trainings.

Then 10 female child patients were presented as with 3 retinitis pigmentosa, 3 nystagmus, 3 B/L amblyopia, 1 chorio Retinal atrophy. 6 patients had far vision less than 1.0 log Mar to finger counting and 4 had more than 1.0 log Mar to 0.5 log Mar, 4 patients had near vision less than 4M and 6 had more than 4M. 9 patients of them got their far vision improved 1.0 log Mar to 0.0 log Mar and near vision to 1M by introducing low vision devices. 1 child was referred to special education center for blind for rehabilitation services.

Table VI indicating the improvement percentage in patients with different diagnosed diseases by using Low vision devices and Table VII represented visual outcome through low vision devices. It was shown by the results of this study that there was significant improvement (85.5%) among patients using low vision devices.

Referrals were made to the patients who did not get improved with low vision devices and sent to rehabilitation services for orientation and mobility trainings and special education center for the blinds to continue educational process.

Age Group (Years)	Frequency	Percentage
Equal or more than 18	22	40
Less than 18	33	60
Total	55	100

Table-I. Age Groups Distribution:
Age in years; Mean = 23.73+2.9

Gender	Frequency	Percentage	Mean Age	Std. Deviation
Male	40	72.7	23.32	2.545
Female	15	27.3	24.27	2.220

Table-II. Gender Allocation:

Male adult				Male child (below 18 years)				Female Adult				Female child (below 18 years)			
V <1.0	A >1.0	NVA <4M	NVA <4M	VA <1.0	VA >1.0	NVA <4M	NVA <4M	VA <1.0	VA >1.0	NVA <4M	NVA <4M	V <1.0	A >1.0	NVA <4M	NVA <4M
10	07	12	05	15	08	12	11	03	02	04	01	06	04	04	06

Table-IV. Visual Acuity Distribution

DISEASES	FREQUENCY	PERCENTAGE	GENDER				
			Male Adult	Male Child	Female Adult	Female Child	Total
Retinitis pigmentosa	16	29.1	5	6	2	3	16
Maculopathy	08	14.2	3	5	-	-	08
Nystagmous	07	12.7	1	2	1	3	07
Glaucoma	05	9.1	2	2	1	-	05
Corneal Opacities	05	9.1	2	2	1	-	05
B/L amblyopia	05	9.1	2	-	-	3	05
Myopic degeneration	04	7.3	1	3	-	-	04
Optic Atrophy	02	3.6	-	2	-	-	02
Albinism	02	3.6	1	1	-	-	02
Chorio Retinal Atrophy	01	1.8	-	-	-	1	01
TOTAL	55	100	17	23	5	10	55

Table-III. Diseases Diagnosed:

*Pearson Chi square = 0.09

DISEASES	IMPROVED	NOT IMPROVED	TOTAL
Retinitis pigmentosa	15	1	16
Maculopathy	4	-	4
Nystagmous	3	2	5
Glaucoma	4	1	5
Corneal Opacities	1	1	2
B/L amblyopia	6	2	8
Myopic degeneration	1	-	1
Optic Atrophy	5	-	5
Albinism	2	-	2
Chorio Retinal Atrophy	6	1	7
TOTAL	47	8	55

Table-VI. Improvement in patients with different diagnosed diseases by using low vision devices

VISUAL OUTCOME	FREQUENCY	PERCENT
Improved	47	85.5
Not improved	8	14.5
TOTAL	55	100

Table-VII. Visual outcome through low vision devices

DISCUSSION

Low vision devices (LVD) facilitate patients with low vision to maximize their vision and to perform their activities and to live independently. LVDs can be deemed for all ages of patients ranging from young children to the adults. LVDs are not only meant for reading purpose but also are employed

to see happenings around us. Different studies have revealed that low vision devices are reliable and effective mode of provision of visual rehabilitations.^{14,15} Our study results also confirmed that low vision aids provision is associated with a statistically significant improvement in both near and distance visual acuities and with patients' fulfillment.

Regardless of the actuality that provision of low vision services established to be associated with improved functional status and quality of life of patients with visual impairment,^{2,16} many of the patients or their health care providers are either unaware of the availability of such services or have no access to it.^{17,18,19,20} The problem is even worse in developing countries where low vision services are striving to exist,^{5,21} and where the economical situation affects the ability of both the health institutions and individuals who are visually impaired to afford such services. In light of the expected increase of numbers in the patients with visual impairment,^{1,22} and with the insufficiency of studies evaluating the effectiveness of low vision aids,^{2,4,23} we aimed at measuring the improvement in distance and near visual acuity after prescribing and training patients in the use of apposite low vision devices. We also aimed at identifying what kind of complaints could hinder the continuity of use of approved devices and how would the patients rate their fulfillment about

the rehabilitation service.

CONCLUSION

There was a significant improvement in far and near visual acuity of the patients suffering from various blindness caused diseases by which patients are able to improve their quality of life and able to do their tasks without getting help from others. This improvement in visual acuity was not significantly related with gender, age and presenting diseases.

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“An empty stomach is not a good political adviser.”

Albert Einstein



AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Muhammad Saad Ullah	1st Author Introduction Methodology Interpretation of results discussion conclusion	
2	Sohail Safdar	Date Entry in SPSS and Results	
3	Muhammad Nabeel Ahmad	Data Collection and Manipulation of Data	