Improving Low Vision Through Multipronged Rehabilitative Techniques Among Low Socio-Economic Patients

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Abstract
In Mahavir Netralaya Kankarbagh Patna, 3070 patients with low vision were examined, investigated and treated by the author in the period between May 2020 to July 2020, using multipronged techniques including thorough clinical examination, investigation, counseling, and an assortment of new rehabilitative tools and techniques. Following this, there was improvement in visual acuity as well as improvement in quality of living where patients were able to undertake several household and profession related tasks and activities. Through this, the author concludes that for low vision patients, following proper diagnosis, and treatment, proper rehabilitation tools and techniques are needed to bring improvement the quality of life.

Keywords: Low-Vision, Aid Treatment, Quality-of-Life-Improvement


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Conflict of Interest: None

Introduction
Oral Low vision is the term used to describe significant visual impairment that can't be corrected fully with glasses, contact lenses, medication or eye surgery¹. It includes: Loss of best-corrected visual acuity, (BVCA) to worse than 20/70 in the better eye. The terms "partial sight" or "partial blindness" or even "poor vision" were used to describe low vision¹. However, a proper definition of low vision, related to visual acuity, will help the scientific community to understand low vision better. One accepted definition is “Low vision is a condition caused by eye disease, in which visual acuity is 20/70 or poorer in the better-seeing eye and cannot be corrected or improved with regular eyeglasses. (Scheiman, Scheiman, and Whittaker)² Currently, India has around 12 million blind people which makes India home to one-third of the world's blind population³. With the increasing life expectancy and thus increasing age related problems, the magnitude of visual impairment is expected to rise in coming years. With this emerging problem, it becomes important to find feasible and effective solutions to improve both visual acuity and quality of life of patients suffering low vision. While “best possible” correction is the first step towards this, “improving simple life-skill”

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through a rehabilitative process is also as important.

**Materials and Methods:** In Mahavir Netralaya Kankarbagh, 3070 patients with low vision were examined, investigated and treated by the author in the period between May to July 2020. Following a systematic screening process including a structured History taking, Clinical examination and relevant lab investigation, a more specific line of investigation for low-vision patients were undertaken. This included assessing visual acuity through Snellens chart for distance, near vision chart; assessing colour vision with Ishihara charts, examination of ocular movements and Schirmer’s test. Newer instruments such as Mono-ocular and Binocular telescopes were used to assess distance vision. Likewise, for near vision-Hand held magnifiers, illuminated and non-illuminated, pocket magnifiers, dome magnifiers, half eye magnifiers, cutaways were all used. According to diagnosis and need, line of treatment included giving different kinds of magnifiers for visual correction and improvement. Special rehabilitation techniques were undertaken; this included M training for the patients with peripheral vision loss, Notex to recognize currency using a variety of new instruments. Also detailed home based rehabilitation exercises and task were given to each patient which were customized according to their situation and needs.

**Findings, Patient Management and Results**

The findings of the study were classified according to Socio-economic and Clinical aspects.

**Socio-economic**

Of the 3070 patients, 84% were males and 16% were females. The age of the patients ranged from 11 years to 66 years. As the clinic is run by a charitable trust, it caters mostly to people of poorer socio-economic condition and this was reflected in the occupation of the primary earning member, which was 78% unskilled, 8% semi-skilled, 5% skilled and only 9% in service, professional or business.

**Clinical**

On examination, the following finding emerged from the patient set:

**Visual Acuity**

On testing for Visual Acuity, it was observed that a majority of the patients had acuity problems with only 10 persons having 6/6 vision. The majority had visual acuity problems of which over 95% had vision poorer than 6/18 in left eye and 98% with vision poorer than 6/18 in right eye. The worst condition of eye-sight poorer than or equal to 6/42 were 43% in right eye and 55% in left eye. (Figure-1)
Other Investigations

The findings of other investigations were as follows among the patients investigated; Rapid Afferent Pupillary Defect: 61% no defect, 39% defect. (Graph-1)

Graph-1 Patients with and without Rapid Afferent Pupillary Defect

3029 patients were examined for color vision of which 59% had normal and 41% had abnormal color vision. (Graph-2)

Graph-2 Patients with Normal and Abnormal Color Vision

3060 patients were examined for near vision of which 91% of patients had near vision of N10. (Graph-3)

Graph-3 Patients Examined for Near Vision

2553 patients were examined for Schirmer’s test of which 57% had severe condition. (Graph-4)

Graph-4 Patients Examined for Schirmer’s Test

The diagnosis of the patients was as per the graph given below. (Graph-5)

Graph-5 Diagnosis of Patients
Patient Management:

A variety of treatment, management and rehabilitative processes were undertaken to improve the sight of the low vision patients. These included trying out a variety of tools, along with counselling, hand-holding and supporting them to do simple tasks and activities. Each patient was treated differently and rehabilitation plan was customized according to the patient’s needs. A few patients were also referred for surgical procedures and tools and therapy given post-surgery.

The break-up of the rehabilitative tools finally administered to the patients were as follows, 2986 were given Telescopic binoculars, 2514 were given dome magnifier, 149 were given stand magnifier, 132 Signature guide, 93 uniocular telescope, 52 hand held magnifier and 33 notex tool. Patients also received multiple tools as per their requirement. (Graph-6)

![Graph-6 Break-Up of Rehabilitative Tools Administered](image)

Results

On testing for Visual Acuity, it was observed that a majority of the patients had improvement in visual acuity 88% in right eye and 89% in left eye having visual acuity equal to or better than 6/18. This was in marked contrast to 2% and 4% in right and left eyes prior to rehabilitation and management.

![Figure-2 Condition of Eye-Sight Right and Left](image)

Results in terms of socials aspects, daily tasks and improvement in quality of life included the patients improved ability for the following tasks: reading newspaper, doing fine and gross work, marked improvement in undertaking household and outside activities and a remarkable regaining of overall personal independence and confidence.

![Graph-7 Improvement Perceived by Patient Post-treatment and Management](image)
96% of them stated that they were very much satisfied. (Graph-8)

Graph-8 Rating of Patient Satisfaction

**Discussion**

The findings of this study have a vital implication because the burden of low vision is gradually increasing; but despite this, there are path breaking and unique tools that can be used in rehabilitation and remarkable improvement of sight. This is not unlike the revolutions in eye-care management brought about by the humble spectacles and the phenomenal cataract surgeries and intra-ocular lens implantation.

Pal et al.4 did a study on 703 children attending blind schools and ascertained the need for spectacles and Low vision devices (LVD) in children with useful residual vision. They concluded that there is large potential for these “incurably blind children” to benefit by use of spectacles and Low vision aids and emphasized the need of visual rehabilitation in these children. Khan et al.5 analyzed the perceived barriers to provision of LVDs among ophthalmologists in India and concluded lack of training/knowledge, lack of awareness, and no availability of LVDs as the major barriers. They emphasized the importance of increasing knowledge and awareness of ophthalmologists about the benefits of low vision rehabilitation.

The important finding in this study was that patients were from lower socio economic conditions, and from a wide range of ages making life overall limited and difficult for them, whether it was related to household work, outside work, schooling or occupation. It was interesting to observe that a significant improvement also occurred in activities indoors and outdoors and a remarkable gain in confidence and satisfaction. This very important inference of the study underscores the need for timely and effective vision rehabilitation to help maximize the quality of life.

Low vision interferes not only with their routine and academic activities but it has also been now well-established that low vision has psychological consequences as well thus making patient feel unconfident and limited. Little things like going outside alone, handling money, reading boosts confidence and enable patients to progress further in life. The tools are also affordable and easy to use, making the case of visual rehabilitation in low vision patients even stronger.

**Conclusion**

This study has helped the author to conclude that for low vision patients, a systematic approach to screening, diagnosis, and treatment is needed, but in addition, nuanced rehabilitation using tools, tasks and techniques both at the clinic and at home can help to bring improvement in the quality of life.
References


