Original Article

Visual rehabilitation of patients with low vision in uveitis

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Purpose: To elucidate the clinical profile of visual impairment (VI) and rehabilitation of the uveitic patients with irreversible low vision. **Methods:** Retrospective analysis of visual rehabilitation of patients with uveitis suffering from poor vision with low vision devices (LVD). **Results:** Most common cause of uveitis was choroiditis (46.29%), followed by retinitis (25.92%), retinochoroiditis (18.51%), and chronic panuveitis sequelae (9.25%). Of these 54 cases, 35.18% had moderate VI, 25.92% had severe VI, 20.37% had mild VI, and 18.51% had profound VI or blindness. Statistically significant improvement ($P < 0.05$) in near vision was seen in choroiditis (52%) and retinitis (72%), whereas clinically significant improvement in distance vision was found in patients with choroiditis. Most commonly prescribed LVD was half-eye prismatic spectacle magnifier (22.2%). **Conclusion:** Rehabilitation of the uveitic patients with low vision is challenging. LVD may be a beneficial tool in these patients to help them perform their day-to-day activities independently.

Key words: Choroiditis, half eyes spectacles, low vision devices, retinitis, uveitis, visual impairment

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Uveitis is one of the leading causes of visual impairment (VI) worldwide and predominantly affects younger individuals.[1] Uveitis accounts for about 10–15% of the cases of total blindness in developed world and up to 25% of all blindness in developing countries.[2-4] Burden of blindness or low vision due to uveitis on the individual and the wider community can be huge, particularly as it tends to affect people at a younger age causing significant socioeconomic impact.

In spite of adequate treatment, patients with uveitis can develop complications such as cataract, glaucoma, band-shaped keratopathy, choroidal neovascular membrane, retinal detachment, cystoid macular edema, optic atrophy, and so on. Majority of these complications have residual VI, which may be benefitted by low vision care services. However, literature on the use of low vision devices (LVDs) in visual rehabilitation of uveitic patients with irreversible vision loss is sparse.[5-7] The aim of the index study was to elucidate the clinical profile and rehabilitation of uveitic patients with low vision who suffered severe irreversible vision loss due to sight threatening uveitis.

Methods

A retrospective chart review of 54 patients with uveitis who were referred to the low vision care (LVC) clinic between January 2014 and June 2016 at a tertiary eye care institute in India was done. Low vision was defined as patients with impaired visual function after adequate treatment of uveitis, having best corrected visual acuity (BCVA) of 6/18 to perception of light in the better eye or constricted field of vision of 10°, but who uses or is potentially able to use vision for the planning and/or execution of a task.[8] Patients with active uveitis and other causes of low vision were excluded from the study. The study adhered to the tenets of the Declaration of Helsinki and was approved by the Institutional Review Board.

All patients underwent a thorough and detailed eye examination including BCVA, slit-lamp examination, intraocular pressure measurement, and fundus examination. BCVA results were converted to logarithm of the minimum angle of resolution (logMAR) units for analysis and are given as logMAR. Distant and near visual acuity (VA) at presentation, refraction, details of the LVDs prescribed, and final VA for distant and near VA with the LVD were analyzed. The low vision assessment and trial were conducted by optometrists experienced in low vision care practice.

Grading of low vision in our patients was done according to the World Health Organization criteria, relating to VA of the better eye with best possible correction: category 0: mild VI with VA better than 6/18; category 1: moderate VI with VA from 6/18 to 6/60; category 2: severe VI from 6/60 to 3/60; category 3 & 4: profound VI from 3/60 to perception of light; and category 5: blindness with no perception of light.[9,10]

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Table 1: Baseline characteristics of patients with uveitis attending the low vision care clinic based on levels of visual impairment

Causes of VI	Mild VI (%)	Moderate VI (%)	Severe VI (%)	Profound and blindness (%)
Healed choroiditis	3 (12.0)	10 (40.0)	10 (40.0)	2 (8.0)
Healed retinitis	1 (7.1)	5 (35.7)	3 (21.4)	5 (35.7)
Toxoplasmosis scar	4 (40.0)	4 (40.0)	1 (10.0)	1 (10.0)
Chronic panuveitis sequelae	1 (20.0)	1 (20.0)	0 (0.0)	3 (60.0)

VI: Visual impairment

Table 2: Low vision devices used in patients with uveitis

Device	Distance, *n* (%)
Single vision spectacles	9 (16.6)
Monocular handheld telescope	2 (3.7)
Device	**Near, *n* (%)**
Bifocal spectacles	15 (27.7)
Half-eyes spectacle eyewear	12 (22.2)
Dome magnifier	6 (11.1)
Handheld magnifier	6 (11.1)
Pocket magnifier	1 (1.8)
Portable video magnifier	2 (3.7)

Distance optical devices were tried to magnify objects up to 3 m or more, whereas near optical devices were used to magnify printed materials and near objects. The patients were given a trial of single or combination of low vision optical and non-optical devices depending on their presenting VA, and the maximum improvement in the VA was noted. A detailed explanation of use of the device and adaptation training with the preferred device was given to patients to enable them to handle the device independently. In addition to the LVD prescription, the instruction manual of the prescribed device was provided.

Monocular handheld telescope (Low Vision Resource Centre [LVRC], Hong Kong Society for the Blind [HKSB])[11] and half-eye prismatic reading eyewear (high-powered reading glasses with a strong prism component that allowed both eyes to read together) are hands-free magnifier which gives a greater field of view and are more comfortable for reading and writing.[12] Handheld magnifiers (LVRC, HKSB)[11] are magnifiers which are more comfortable for spotting, give better working distance, and are portable. Stand magnifiers (LVRC, HKSB)[11] are magnifiers which give wider range of magnification with limited field of view. Dome magnifiers (LVRC, HKSB)[11] are magnifiers which are more comfortable for continuous reading tasks with a convenient working distance. Pocket magnifiers (LVRC, HKSB)[11] are magnifiers with a wide range of magnification and mostly used for spotting.

Statistical analysis included descriptive statistic: percentage, means, or medians according to normal distribution and standard deviation (95% confidence interval) or interquartile range as appropriate. We processed and analyzed data using SPSS 20.0 (IBM Corporation, Armonk, NY, USA).

Results

The mean age of the patients in this study was 33.14 + 17.85 years. Thirty patients (56%) were male and 24 patients (44%) were female. Six (5.5%) patients were below the age of 16 years. The patients were again classified as students (24.07%), employed (33.3%), and unemployed (37.03%). Macular involvement due to uveitis was noted in 37 (68.51%) patients and optic disc involvement was observed in 22 (40.74%) patients in this study. Prior history of surgical intervention was noted in 25.92% of the patients.

Of the 54 cases evaluated, 35.18% (17) had moderate VI, 25.92% (14) had severe VI, 20.37% (13) had mild VI, and 18.51% (10) had profound VI or blindness. The most common cause of low vision in our study was choroiditis (46.29%), followed by retinitis (25.92%), retinochoroiditis (18.51%), and chronic panuveitis sequelae (9.25%) [Table 1]. Fifty-one patients (94.4%) had low vision in both the eyes and three (5.5%) patients had near total blindness in the worse eye.

The type of devices prescribed is described in Table 2. In 59.45% of the cases, single LVDs were sufficient, whereas in 16.21% of the cases, more than one device was required. Monocular handheld telescope was prescribed for seeing distance objects (4%). The most commonly prescribed LVD for near vision improvement was half-eye prismatic reading eyewear (22%), followed by dome magnifier (11%). Handheld magnifier (11%), pocket magnifier (2%), and portable video magnifier (4%) were prescribed for spotting tasks. Bifocal spectacles were prescribed for 28% of patients to improve the clarity of vision. Maximum low VI correction was prescribed for moderate VI in 18 (33.33%) patients, followed by 10 (18.51%) patients with severe VI, 7 (12.96%) with profound VI, and 5 (9.26%) patients with mild VI. Patients with severe VI were also given visual rehabilitation training in order to carry out their daily living activities independently. Three children with VA of perception of light and no perception of light in the better eye were explained about the need for visual rehabilitation training including mobility training, self-help skills, and were advised to join in blind school. Non-optical devices included Notex for currency identification which was prescribed for three (5.56%) patients and reading stand for four patients (7.4%) to increase postural comfort.

Table 3 shows the improvement in distant and near vision after the use of low vision aid device. Maximum improvement in distant vision was seen in patients with toxoplasmosis scar (10%). Patients with healed choroiditis and healed retinitis showed a statistically significant improvement in near VA after the use of LVDs (52.2% and 71.7%, respectively) ($P < 0.05$).

Discussion

Uveitis has been reported to cause VI in a significant proportion of patients of working age group in the developing world.[13] In our study, 43% of the patients with uveitis sequelae who

Table 3: Distant vision and near vision improvement with low vision devices in different causes of visual impairment among people with uveitis

Causes of VI	Distance visual acuity (logMAR)				Near visual acuity (*n* notation)			
	Pre	Post	Percentage change	*P*	Pre	Post	Percentage change	*P*
Healed choroiditis	0.93	0.87	6.8	0.002	16.68	7.96	52.2	0.000015
Healed retinitis	1.23	1.15	8.2	0.087	19.5	5.5	71.7	0.00045
Toxoplasmosis scar	0.98	0.88	10.0	0.084	6.22	6	3.5	0.3465
Chronic panuveitis sequelae	1.58	1.48	6.3	0.141	21	8.5	59.5	0.1026

VI: Visual impairment, logMAR: Logarithm of the minimum angle of resolution

visited the low vision care clinic were in the working age group of 20–40 years.

The mean age of people with uveitis was 33.1 years in our study similar to other reports.[5,7] Majority of the literature on uveitis from developed countries report either an equal gender distribution or slight predominance of women. Studies from the developing world, on the other hand, reported male predominance including our study.[14,15] A socioeconomic bias can be held responsible for this observation. Possibly men are likely to seek medical attention earlier than women in Indian societies and have more financial and social freedom to do so.[16] This is significant if the patient is the primary earning member and may add to the economic burden.

Most of the patients (42.5%) were prescribed best refractive spectacle correction, which highlights the importance of appropriate refraction and optimal prescription of spectacles. Majority of the patients were benefited by LVD (53.70%) in our study, which can be attributed to the relatively higher number of uveitic patients with moderate VI (35.18%) and then with severe VI (25.92%). In a study of 101 patients with low vision due to diabetic retinopathy, Fonda[12] reported that half-eye spectacle magnifiers improved the vision in 45% cases of their patients. We observed the same beneficial effect of half-eye spectacle in patients with low vision due to uveitis also and the most common LVD prescribed in our study was half-eye spectacles (22.2%). In addition to prescribing optical devices, our patients were also advised to increase the environmental lighting during reading tasks. The latest available electronic devices (Closed Circuit TeleVision [CCTV]) with higher range of magnification (more than 20×) and with options of reverse contrast were comfortable for patients with low vision. Although the patients with uveitis will have fluctuation in visual status, the variable magnification and contrast level options in electronic magnifiers would be useful in resuming the visual activities of patients.

The significant improvement in near and distant vision following the use of LVD in index study helped the patients who suffered severe irreversible vision loss due to uveitis. Our data showed that LVD can be helpful in these conditions, making the patients more ambulatory and may help them to be gainfully employed with proper training. However, some conditions such as healed retinochoroiditis scar and sequelae of panuveitis had showed poor response to LVD which has been reflected in limited VA improvement in these patients in our study.

The strength of this study is that, to our knowledge, this provides the first attempt to review the clinical profile and rehabilitation of low vision comprehensively in patients with uveitis. Patients were referred for low vision care services where medical treatment had limitations. In such cases, our study shows beneficial role of LVD in the rehabilitation of patients with severe, irreversible loss of vision due to uveitis. Qualitative improvement was noted in terms of visual performance and psychological confidence in majority of our patients. Quantitative assessment of parameters such as quality of life would help in further analysis. Long-term training with use of LVDs has shown to give better visual improvement,[17] which would be the future scope of this study.

Conclusion

Low vision intervention including prescription of appropriate devices will be very useful in improving the VA, thus improving their independence, ambulation, and even resumption of their profession. The use of LVDs can help these patients, at least those with residual vision, where medical and surgical treatments have none or a limited role in restoring useful vision.

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Conflicts of interest

There are no conflicts of interest.

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