CASE REPORT

Improving management of visually impaired patients from occupational therapy perspective: A case report

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SUMMARY

The ability to detect and recognise visual deficits among visually impaired patients can improve the management of daily living skills and activities of these patients. In this report, the importance of using objective and subjective visual performance measures by occupational therapists in managing visually impaired patients is discussed. We describe a case of a 17-year-old Malay female who had vision impairment due to a cataract, a secondary complication from diabetes mellitus (DM). The Brain Injury Visual Assessment Battery for Adult (biVABA) can provide occupational therapists with additional visual performance information and a better understanding of managing visually impaired patients. The biVABA was used in conjunction with other activities of daily living skills tools such as Modified Barthel Index (MBI), Lawton Instrumental Activities of Daily Living Scale (IADL) and EVS Orientation and Mobility Screening (EVS-O&M) for a more holistic assessment. This approach provides more relevant and essential information in managing visually impaired patient rehabilitation from the occupational therapy perspective.

INTRODUCTION

Visual impairment affects all aspects of daily activities, from the simplest self-care tasks, to the ability to continue to drive safely and return to work.[1] Managing daily life in people with visual impairment can be challenging. Therefore, it is critical to recognise the changes that require visual skills to manage their daily activities. Deficits in visual processing are generally not significant as long as they do not affect occupational performance. Treatment of patients with visual impairment should focus not only on maximizing residual vision but also on improving functional abilities to perform daily activities. Therefore, a comprehensive occupational therapy assessment is essential and must be integrated into rehabilitating patients with visual impairment.[2] There are many objective measurement tools to assess visually impaired patients such as Modified Barthel Index (MBI), Lawton Instrumental Activities of Daily Living Scale (IADL) and EVS Orientation & Mobility Screening (EVS-O&M). However, most tools did not provide holistic visual information especially visual functional abilities. Specific visual performance such as visual acuity, visual field, reading ability, contrast sensitivity function, oculomotor function and visual attention could be measured using the Brain Injury Visual Assessment Battery for Adults (biVABA).[3] This paper will discuss the use of biVABA and how it can assist in managing visually impaired patient using a case study.

CASE REPORT

A 17-year-old Malay girl was referred to the Occupational Therapy Clinic, Universiti Kebangsaan Malaysia (UKM), for rehabilitation. She was diagnosed with diabetes mellitus (DM) type-1 for five years and suffered from dilated cardiomyopathy (DCM). She had cataract secondary to DM and underwent crystalline lens aspiration of the right eye (RE) at 14 years old and later developed blindness due to the surgery complications. She had high myopia in the left eye (LE). She was prescribed insulin twice daily. There was no family history of other medical conditions except DM. She is currently on regular follow-up for her DM. Her main complaints at the occupational therapy session were 1) blurred vision at distance and near, but she had never used or was prescribed any visual aids, 2) disorganisation in managing personal items, and 3) difficulty with orientation and mobility. Her academic performance has deteriorated since Form 2, and currently attending Form 5 in a residential special school for the blind.

During examination with the biVABA, the Clinical Observation Indicating Visual Impairment component showed her LE pupillary responsiveness to light stimulation and accommodation was constricted plus sluggish. Her unaided distance vision for RE was light perception (LP), while for LE was 6/48, and no improvement with pinhole. Vision for both eyes was 6/48. With the addition of +10.00 Ds, she was able to read N26 at 10 cm. On functional contrast sensitivity testing, she recognised target numbers only at the 25% level. Visual field assessment with the two-person kinetic confrontation test was measured, and the peripheral visual field in the LE appeared to be impaired (Figure 1).

The general result of her basic visual function tests from biVABA indicated that her pupillary response was affected. This resulted in her eyes being slow in adapting to changes in illumination. In addition, reduced visual acuity, visual field extend and contrast sensitivity function resulted in difficulty to identify visual details. This led to below average reading

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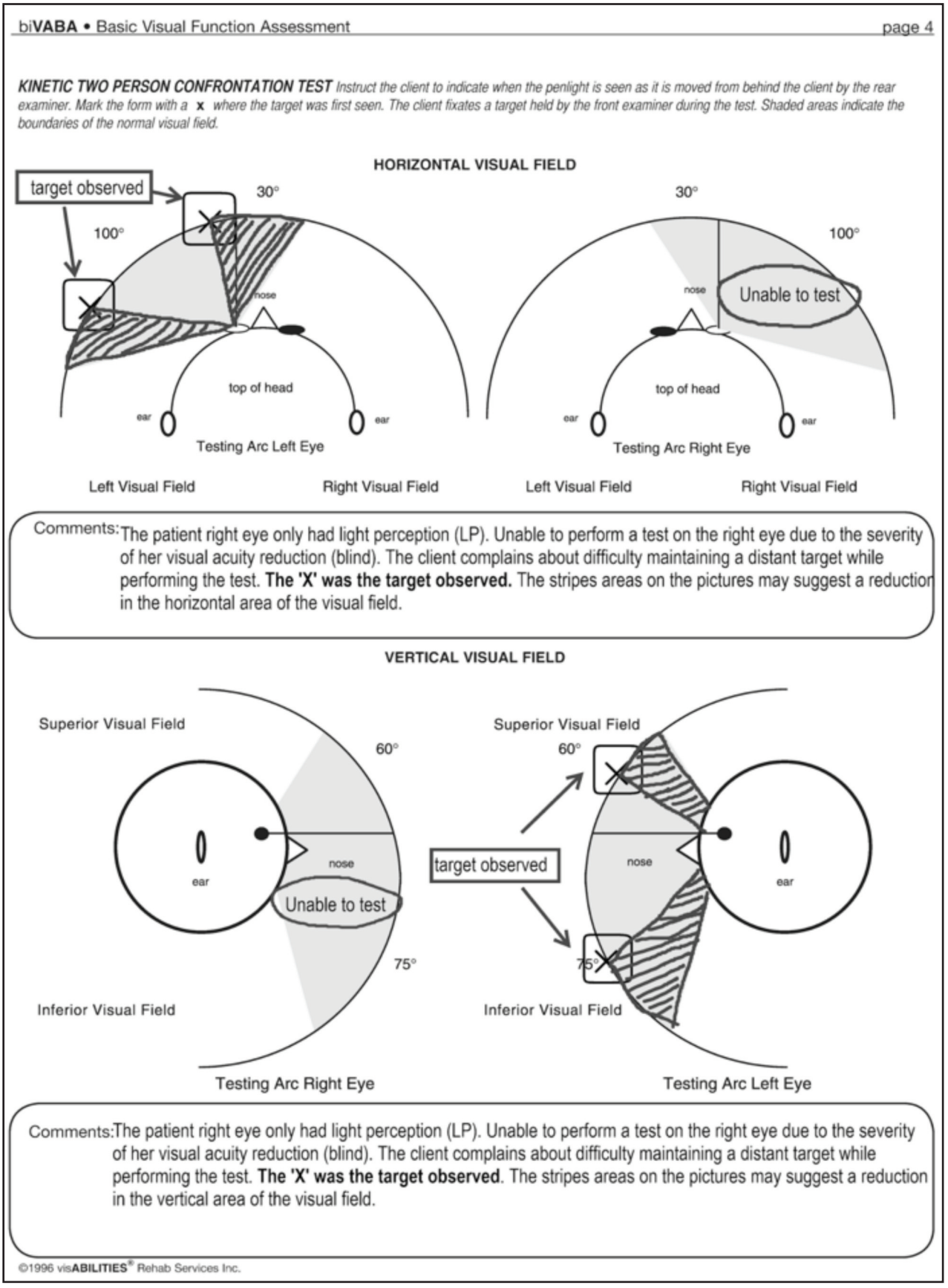

Fig. 1: Visual Field - Kinetic Two Person Confrontation Test

Table I: Summary performance for Visual Attention Assessment of the biVABA

Categories		Search pattern	Time (Norm Average in seconds)	Correct Response (Norm Average in %)	Functional Effect
I. Search strategies for Near Space:					
i) Single Letter Search	Simple	Symmetrical horizontal left to right pattern [1]	288[2] (82)	50[3] (97)	May indicate of difficulty in reading and writing skills
	Crowded		300[2] (112)	40[3] (97)	
ii) Word Search			358[2] (88)	27[3] (98)	
iii) Random Plain Circles	Simple		78[2] (23)	90[3] (100)	
	Crowded		105[2] (49)	85[3] (100)	
iv) Structured Complex Circles Search		Random, no predictable pattern [1]	143[2] (52)	50[3] (99)	
II. Attention to Visual Detail: Design Copy					
House Flower Clock		Using ineffective search strategy for this test	78 (27)[4] 62 (27)[4] 67(27)[4]	1 detail is missing from each drawing[5]	May indicate of presence with inattention and difficulty in reading and writing
III. Search Strategies for Extra Personal Space					
Scan board[6]		Randomly & unpredictable. Initiated from left to the right side.	N/A	All targets are located but had one number was being repeated.	May indicate of memory deficits, difficulty in reading and writing

[1] Using effective and systematic searching strategies for all subtests in near space except for the structured complex circles search.
[2] Overall times performances were impaired.
[3] Overall correct response performances were below average.
[4] Overall times performances were impaired.
[5] Analysis data for correct response of the design copy using norm cut off % (1 error). If more than 1 error is indicating of low performance.
[6] The target number was bold to increase visibility.

Table II: Score summary of MBI, IADL, EVS & O&M assessment at baseline and at 3 months visit

Assessments Tools	Total marks	Baseline 1st assessment mark (%)	3 months 2nd assessment mark (%)	Percentage of Improvement (%)
Modified Barthel Index (MBI)	100	96 (96)	96 (96)	0
Lawton Instrumental Activities of Daily Living Scale (IADL)	8	3 (37.5)	5 (62.5)	25
EVS Orientation & Mobility Screening (EVS O&M)	25	15 (60)	17 (68)	8

speed performance. Furthermore, a significant mobility problem was observed as she could not see overhead signs and floor paths to navigate safely. She was referred to low vision clinic and was prescribed a pair of spectacle magnifiers with +10.00 Ds for near work and a monocular 3x telescope for distance usage.

The eye movement test showed unequal corneal reflections when the eyes moved. She could not fixate on a target or object at 40 cm but able to do so at 25 cm. The RE was always in an upward position, and the LE did not follow the pen torch smoothly. In addition, an unequal ratio or proportion of sclera to iris was observed in each gaze. All findings in the Oculomotor Function Assessment of the biVABA indicated restricted movement of both eyes in all directions of gaze, suggesting paresis or paralysis of the muscle. She also reported difficulty achieving focus during near vision tasks that required her to maintain focus. These findings also suggest possible problem with binocular vision issues. The patient suffered from nausea and blurred vision during head movements suggested visuo-vestibular dysfunction and was referred to the Ear, Nose and Throat Clinic for further investigation and treatment.

In the Visual Attention Assessment of the biVABA, the search strategies for near space, attention to detail and search strategies for the client's additional personal space were measured objectively along with subjective observation. When performing the near-space search strategies, the client was tested using an electronic table magnifier and a closed-circuit television (CCTV) system. Results showed a decrease in reading performance while using both types of equipment and a significantly increased difficulty in maintaining attention. However with effort, she was able to maintain concentration for an extended period. These findings suggest that her attention skills were generally adequate and her difficulties were visual. The search strategies for extra personal space showed that she had a random, slow and unpredictable search pattern, with scanning initiated from left to right. These findings are summarised in Table I. This

deficit in visual tracking makes her community ambulation unsafe, leading to anxiety and restlessness during this activity. Besides, it also affected her in reading and written work. During the rehabilitation session, she was informed and explained about the importance of environmental modifications in reading, optimising ambient lighting, reducing glare, increasing print size and contrast. She was also taught on scanning techniques, using eccentric vision and visual perception activities. The scanning exercise involved in getting her to look frequently and consistently in the direction of her blind right side. Therapy sessions were held twice a week for four weeks.

The MBI score was 96/100, indicated that she could perform all tasks independently but still required some level of supervision, especially in personal hygiene to achieve an adequate level of cleanliness. Using the IADL skills questionnaire, she scored 3/8, able to do her laundry and perform simple household chores. She was able to do some shopping, such as buying groceries at a special school mini-mart and managing her medications with caretaker assistance. She was not confident going up the stairs and sometimes bump into objects in all directions, even in a familiar environment. These findings were consistent with her IADL low scores. Furthermore, she was unable to perform any meal preparation or use public transportation for traveling. Her EVS-O&M score was 15 and she was recommended to undergo orientation and mobility training. She completed the training however, she was unwilling to use the white cane.

After three months, the patient returned for follow-up. A routine functional assessment was performed, MBI, IADL, EVS-O&M screening were repeated. Discussion with the attending optometrist revealed that visual acuity and visual field status for LE was unchanged. The IADL score was 5/8, indicating that her ability to shop and do simple food preparation had improved. However, she required assistance when using public transportation and money management. The MBI score remained the same, while the EVS-O&M score increased to 17/25 (Table II). These findings indicate she was able to avoid moving objects before contact while travelling. She also accepted and used her white cane in her daily activities. The orientation and mobility training enabled the patient to participate more confidently in outdoor activities and travel independently. Follow-up was recommended to the patient six-monthly at the occupational therapy and low vision clinics to monitor her progress.

DISCUSSION

Typically, the visual function status and visual efficiency assessment are not considered in routine occupational therapy assessment[2] or at follow-up occupational therapy clinic sessions in Malaysia. Without acknowledging the importance of visual efficiency, this can reduce responsiveness to rehabilitation programmes and interfere with overall progress.[4] From this case study, using biVABA enables the occupational therapist to identify the difficulties during academic classes the patient experienced such as reading and writing with varying degrees of severity. These findings were in agreement with previous study which recommended that it is vital for the therapist to understand visual acuity, accommodation, binocular vision and ocular motor abilities in a typical elementary school classroom.[5] Previous study also have found that 75% of academically related task time in the classroom is spent on reading, writing at a near distance and on tasks requiring near to distance to near alternate viewing. Children with vision impairment usually performed significantly weaker on educational tests compared to normal children.[6]

Comprehensive occupational therapy assessment on visual function of low vision patients is an essential aspect during rehabilitation because visual impairment can affect the quality of life.[2,3,5] The visual impairment suffered by this patient was blind in RE and mild low vision in LE. Based on the eyes' binocularity, the visual impairment was considered in the range of mild to moderate with loss of depth of perception. However, the impact of the vision impairment on her daily activities was profound. This can be seen where the patient experienced difficulty moving around in a community setting and in daily activities despite only having mild to moderate visual impairment. The low scores of the IADL and the EVS-O&M assessment support these findings.

When the quality of life declines, the patient's motivation to participate in social activities may also reduce. Subsequently, the low vision patient tends to withdraw from families, friends and society which can eventually accelerate further mental health problems.[7] Rehabilitation programmes helped the patient improve her ability to cope with her daily activities. After three months of rehabilitation, her score for MBI, IADL, and EVS-O&M screening showed significant improvement. These achievements motivated the patient to be engaging more with her daily activities and improve her quality of life. Therefore, in order to develop and implement an effective facilitative or rehabilitative programme, therapeutic techniques and functional activities need to be individualised and cater to their visual needs and capabilities of the visually impaired patients.

CONCLUSION

This case study demonstrated that using biVABA during the initial assessment of the low vision patient helped the occupational therapist to be able to identify unrecognised visual deficits which were normally not being access by the occupational therapist. The biVABA also guided all subsequent referrals by the occupational therapist to the relevant clinics. Furthermore, it provides a more holistic understanding of the visually impaired patients' visual status, behaviour and task performance needs. By combining the biVABA, MBI, IADL, and EVM-O&M assessment occupational therapists will be able to provide a more comprehensive and appropriate rehabilitation plan tailored to the visually impaired needs to improve their daily living skills and quality of life. In conclusion, it is recommended that the biVABA assessment to be added during the initial case assessment. The information gathered would enhance the occupational therapists' ability to understand how each visual function affects the patient's daily activities and quality of life. Only then a proper rehabilitation can be prescribed from the perspective of occupational therapists.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and the accompanying images.

COMPETING INTERESTS

The authors declare that they have no conflict of interest.

AUTHORS' CONTRIBUTIONS

RO designed the construct, rewrote and critically reviewed the manuscript, NR examined the patient, analysed, interpreted investigative data and prepared the manuscript, MW examined and implemented intervention, SK critically reviewed investigative data and manuscript. All authors have read and approved the final manuscript.

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