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ORIGINAL ARTICLE

Visual functions and disability in diabetic retinopathy patients

Gauri Shankar Shrestha[a,*], **Raju Kaiti**[b]

[a] *B.P. Koirala Lions Centre for Ophthalmic Studies, Institute of Medicine, Tribhuvan University, Maharajgunj, Kathmandu, Nepal*
[b] *Department of Ophthalmology, Kathmandu University Medical College. Dhulikhel, Nepal*

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KEYWORDS
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Abstract
Purpose: This study was undertaken to find correlations between visual functions and visual disabilities in patients with diabetic retinopathy.
Method: A cross-sectional study was carried out among 38 visually impaired diabetic retinopathy subjects at the Low Vision Clinic of B.P. Koirala Lions Centre for Ophthalmic Studies, Kathmandu. The subjects underwent assessment of distance and near visual acuity, objective and subjective refraction, contrast sensitivity, color vision, and central and peripheral visual fields. The visual disabilities of each subject in their daily lives were evaluated using a standard questionnaire. Multiple regression analysis between visual functions and visual disabilities index was assessed.
Result: The majority of subjects (42.1%) were of the age group 60–70 years. Best corrected visual acuity was found to be 0.73 ± 0.2 in the better eye and 0.93 ± 0.27 in the worse eye, which was significantly different at $p = 0.002$. Visual disability scores were significantly higher for legibility of letters (1.2 ± 0.3) and sentences (1.4 ± 0.4), and least for clothing (0.7 ± 0.3). Visual disability index for legibility of letters and sentences was significantly correlated with near visual acuity and peripheral visual field. Contrast sensitivity was also significantly correlated with the visual disability index, and total scores.
Conclusion: Impairment of near visual acuity, contrast sensitivity, and peripheral visual field correlated significantly with different types of visual disability. Hence, these clinical tests should be an integral part of the visual assessment of diabetic eyes.

* Corresponding author.
E-mail addresses: gs101lg@hotmail.com, gaurishshrestha@yahoo.com (G.S. Shrestha).

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PALABRAS CLAVE
Disfunciones visuales;
Funciones visuales;
Retinopatía diabética

Funcionalidades visuales y discapacidad visual en pacientes con retinopatía diabética

Resumen
Objetivo: Este estudio se llevó a cabo para hallar las correlaciones existentes entre las funcionalidades visuales y el nivel de discapacidad visual en pacientes con retinopatía diabética.
Método: Se realizó un estudio transversal en 38 pacientes con retinopatía diabética y disfunción visual en la Clínica de Baja Visión del B.P. Koirala Lions Centre para estudios oftalmológicos de Katmandú. Los pacientes fueron sometidos a estudios de agudeza visual cercana y lejana, refracción objetiva y subjetiva, sensibilidad de contraste, visión de color y campos visuales central y periférico. Se evaluó el nivel de discapacidad visual de cada paciente en su vida diaria mediante un cuestionario estandarizado. Se realizó un análisis de regresión múltiple para determinar la relación existente entre las funcionalidades visuales analizadas y el nivel de discapacidad visual.
Resultado: La mayoría de los pacientes (42,1%) pertenecían al grupo de edad de 60–70 años. Se halló que la agudeza visual mejor corregida se situaba en $0{,}73 \pm 0{,}2$ en el mejor ojo, y en $0{,}93 \pm 0{,}27$ en el peor ojo, existiendo una diferencia estadísticamente significativa, $p = 0{,}002$. Los índices de discapacidad visual fueron considerablemente superiores para la legibilidad de letras ($1{,}2 \pm 0{,}3$) y frases ($1{,}4 \pm 0{,}4$), y los mínimos para la ropa ($0{,}7 \pm 0{,}3$). El índice de discapacidad visual para la legibilidad de letras y frases presentaba una correlación significativa con la agudeza visual cercana y el campo visual periférico. También la sensibilidad de contraste mostró una correlación considerable con el índice de discapacidad visual y las puntuaciones totales.
Conclusión: Las deficiencias de la agudeza visual cercana, la sensibilidad de contraste y el campo visual periférico se correlacionaron significativamente con los diferentes tipos de discapacidad visual. Por tanto, estas pruebas clínicas deberían constituir una parte integral de la evaluación visual de los ojos de los pacientes diabéticos.

Introduction

Visual impairments secondary to diabetic retinopathy represent a major public health problem.[1,2] Legal blindness accounts for 83% of visual impairment among persons with youth-onset diabetes, and 33% among persons with older age onset diabetes.[1] Diabetes alone can increase the risk of blindness 25 times.[2] Diabetic retinopathy occurs in approximately 7–29% of patients attending general medical practices.[3–7] Approximately two-thirds of diabetics have an increased possibility of visual impairment after 35 years of suffering the condition, and are 25 times more likely to go blind, compared with other health conditions.[1]

Low-vision patients perceive marked impairment of functional status, daily living activities, and quality of life.[8–11] A person with low vision due to diabetic retinopathy often experiences difficulties with activities such as identifying faces, reading bus numbers from a distance, reading small and low contrast print, writing in a straight line, intolerance to light, and difficulty in moving outdoors after dusk, shopping, cooking and locating food, seeing the time on a watch, or differentiating coins and bank notes of similar dimensions.[12]

Visually impaired diabetics have specific needs to be addressed. They need to be able to see well enough to fill insulin syringes, read the labels of oral medications, and to see their blood sugar level indicators. They may also have neuropathies affecting their feet. Hence, utilizing remaining vision to its fullest potential becomes paramount in such cases.[12,13]

Recent studies reported various grades of diabetic retinopathy in 21–47% of diabetic patients in Kathmandu.[14–17] Visual impairment among diabetics was reported at 15.2–15.6% and legal blindness at 1.5–2.3%.[16,17] However, visual function parameters which have an impact on visual disabilities have not been extensively studied in Nepal. The present study was carried out to find the relationships between impairments of visual functions and visual disabilities, and to determine the function parameters which have greater impact on causing disabilities among Nepalese people with diabetic retinopathy.

Method

Subjects and sample size

A hospital-based cross sectional study was carried out among 59 subjects referred to the Low Vision Clinic (LVC) from the Retina Clinic at B.P. Koirala Lions Centre for Ophthalmic Studies (BPKLCOS) in the period January to June 2010. Subjects having diabetic retinopathy and visual acuity equal to or less than 6/18 were enrolled in the study. Subjects having any other associated ocular pathology which was not attributable to diabetes, with currently uncontrolled blood sugar, or being treated with pan-retinal photocoagulation for less than 6 weeks, were excluded from the study.

Informed consent was obtained from all subjects and their attendants after explaining to them the purpose of the study. The subjects were requested to bring to the clinic