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Published in Eye Care

Journal Scan / Research · May 25, 2020

The King-Devick Color Contrast Sensitivity Chart in AMD

The British Journal of Ophthalmology

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- The visual acuity of 85 patients with age-related macular degeneration (AMD) was evaluated in a single study visit and compared with healthy controls. The study included 45 patients with exudative AMD and 42 with non-exudative AMD. Vision was assessed first with black contrast and subsequently with color contrast using various colors and intensities. Patients with exudative AMD demonstrated decreased visual performance under various color contrast settings compared with healthy controls or those with non-exudative AMD. Color contrast performance using yellow and blue differentiated more advanced exudative disease from earlier non-exudative disease. Color contrast performance with blue and black more accurately identified the exudative AMD group from healthy controls and the non-exudative AMD group.
- Color contrast measures can potentially serve as an adjunctive clinical tool to identify subtle alterations in visual function and to differentiate disease severity. Unlike optical coherence tomography thickness, color contrast directly affects patient function and perception.

– Raza M. Shah, MD

Abstract

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OBJECTIVE

This study aimed to determine which colour contrast sensitivity differences exist in early to advanced age-related macular degeneration (AMD) and examine the potential utility of the King-Devick Variable Color Contrast Sensitivity Chart in detecting AMD severity.

METHODS AND ANALYSIS

A total of 85 participants (144 total eyes) were recruited from multiple clinical practices and enrolled in the study. The control group consisted of 57 healthy eyes. The non-exudative AMD (NE-AMD) group consisted of 45 eyes. The exudative AMD (E-AMD) group consisted of 42 eyes. In a single study visit, monocular best-corrected visual acuity (BCVA) at 40 cm with 100% black contrast was determined for each eye. Using the BCVA line, the number of letters correctly identified (out of 10) was recorded for various colour presentations (red, green, blue and yellow) and at decreasing contrast levels (100%, 75%, 50% and 25%).

RESULTS

Our results show worse visual performance under various colour contrast settings in E-AMD patients compared with healthy controls and NE-AMD. Colour contrast performance using blue and yellow differentiated more advanced stages of disease in E-AMD from earlier NE-AMD disease. Blue and black colour contrast performance more accurately identified the E-AMD group from healthy controls and the NE-AMD group.

CONCLUSION

The findings of this study demonstrate that colour contrast, particularly with black, blue and yellow, is impaired in E-AMD suggesting the potential for colour contrast measures to serve as an adjunctive clinical tool in identifying subtle altered visual function as well as the potential for detecting disease severity.

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Use of the King-Devick Variable Color Contrast Sensitivity Chart to Differentiate Stages of Age-Related Macular Degeneration
Br J Ophthalmol 2020 May 01;5(1)e000451, S Ittiara, AS Hariprasad, LV Messner, DJ Tresley, D Leong, SA Schechet

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Impact of Color in the Assessment of Potential Visual Acuity in Age-Related Macular Degeneration

PracticeUpdate, 2013

Photocromic and Selective Blue-Violet Light Filtering Spectacle Lenses Improve Visual Function

PracticeUpdate, 2017

Influence of Retinopathy on the Achromatic and Chromatic Vision in T2DM

PracticeUpdate, 2014

Association of Visual Function Measures With Drusen Volume in Early AMD

PracticeUpdate, 2020

Microperimetry and Low-Luminance Visual Acuity in Age-Related Macular Degeneration

PracticeUpdate, 2015

When color helps

Costa et al., *einstein* (São Paulo), 2018

En face slab optical coherence tomography imaging successfully monitors progressive degenerative changes in the innermost layer of the diabetic retina

Atsuko Katsuyama et al., *Open Diab Res Care*, 2020

Visual impairment and mortality in patients with type 2 diabetes

Volkert Siersma et al., *Open Diab Res Care*, 2019

Free radical oxidation reaction for selectively solvatochromic sensors with dynamic sensing ability

Shen et al., *Chinese Chemical Letters*, 2019

How Convolutional Neural Networks Diagnose Plant Disease

Yosuke Toda et al., *Plant Phenomics*, 2019



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