onorganic visual loss (NOVL), also known as functional visual loss, is visual loss in the absence of evidence of a causal organic abnormality. The diagnosis of NOVL often presents a challenge to the ophthalmologist; ensuring that one has not overlooked a treatable, organic disease can be a frustrating, expensive, and time-consuming process in the face of poor reporter reliability.

Automated perimetry is often inadequate in the analysis of nonorganic visual field loss (NOVFL). Abnormalities in indices of reliability (false-positive and false-negative rates and percentage of fixation losses) may be present in both organic and nonorganic disease.1 Furthermore, informed malingerers are able to reproduce visual field abnormalities on automated perimetry that appear consistent with results of patients with genuine visual field abnormalities on automated perimetry that are suggestive of NOVFL have been described. It is important that one has not overlooked a treatable, organic disease.

Several patterns of visual field loss using kinetic perimetry that are suggestive of NOVFL have been described, including the spiral field, star-shaped field, and tubular field.3 However, prior studies report a success rate of less than 50% in demonstrating these types of fields using Goldmann kinetic perimetry.4

Here we describe a novel use of kinetic perimetry designed to efficiently demonstrate and document a target visual field consistent with nonorganic visual field constriction.

**Methods. Study Population.** Institutional review board approval was obtained from Baylor College of Medicine. Twenty-six consecutive patients (45 affected eyes) with NOVL were seen by a single neuro-ophthalmologist (R.F.) at the Baylor College of Medicine Eye Clinic during an 8-month period from August 1, 2004, to April 1, 2005.

Patients with NOVL who did not have a visual field defect, did not show up for their scheduled appointment for kinetic perimetry, or either were unable to fixate or responded only at central fixation in that eye during kinetic perimetry were excluded from the study population. This number included 1 patient with bilateral NOVFL who could not fixate in 1 eye.

Thus, our final study population included 32 affected eyes in 18 consecutive patients who met the following criteria: (1) had visual loss that was found to be greater than that demonstrated on examination; (2) had no evidence of organic disease on examination, neuroimaging, and/or electrophysiological testing that could explain the visual loss; and (3) successfully completed kinetic perimetry.

A control group included 2 eyes of 2 healthy subjects with no history of ocular disease except refractive error and with normal ophthalmic examination results as well as 8 eyes of 8 patients with documented organic visual field loss (5 eyes with primary open-angle glaucoma and 3 eyes with nonarteritic anterior ischemic optic neuropathy) who had visual field defects previously documented on automated perimetry.

**Repeated III4E Isopter Method for Kinetic Perimetry.** Using a Goldmann kinetic perimeter, the III4e and then the V4e isopters were plotted in the typical manner in which the stimulus presented from the periphery and moved toward fixation sequentially along opposite meridians. The III4e isopter was repeated beginning at the threshold previously plotted for the III4e isopter and then slowly moved toward fixation. This method of kinetic perimetry was also performed for the control group.

**Results.** The patient with NOVFL typically did not respond to the second III4e isopter stimulus when it first appeared, despite having seen the same stimulus at that position previously. As a result, the field plotted with the second III4e isopter was more constricted than the field plotted with the first III4e isopter, effectively demonstrating a variable visual field in the form of a target pattern that was obviously not consistent with organic disease (Figure 1).

A target pattern was defined as a pattern in which all or nearly all plots formed using the repeated III4e isopter were located more centrally than the plots formed using the original III4e isopter (Figure 1). Patients in whom a visual field was documented with the first III4e isopter but who then only responded at fixation on repeating the III4e isopter were included as having a positive target pattern. In 1 patient with bilateral visual loss, 1 eye did not respond to any stimulus in the temporal hemifield such that it was equivocal whether a true target pattern was present. We did not consider this eye to demonstrate a target pattern during our analysis.

The study population included 5 men (28%) and 13 women (72%). Three patients (17%) had unilateral visual loss, whereas 15 patients (83%) had bilateral involvement. Half of the patients (9 patients) had isolated visual field defects, while the other half (9 patients) had combined visual acuity and visual field loss. Thirteen patients (72%) had a history of depression, fibromyalgia, and/or anxiety.

Twenty-nine eyes (91%) in the study population showed a target pattern. No eyes in the control group demonstrated a target pattern. In the control group, virtually identical visual fields were plotted with the first and second III4e isopters, with minimal variation attributable to response lag time (Figure 2A and B).

**Comment.** A number of techniques designed to support the diagnosis of NOVFL have been described. It is important for these tests to be efficient, effective, and rela-
same size despite variation in the distance between the sub-

demonstrated in the tubular field in which the visual field is the 

color, which is itself thought to be psychogenic in ori-
gan.3 However, demonstration of such fields is inconsistent in patients with NOVFL because rapid fatigability is often not present.4 In contrast, the target visual field is a product of the variability inherent to the condition of NOVL. A prior study has demonstrated an average of 14° in variation when patients with NOVFL were shown the same isopter on a single meridian 10 consecutive times during kinetic perimetry.3 This consistency of variability is corroborated by the presence of a target visual field in 91% of the eyes in our study population.

Tunnel vision, or concentric constriction, is the most common visual field defect found in NOVFL.3 This is reflected in the tubular field in which the visual field is the same size despite variation in the distance between the sub-
ject and the examiner. Although the tubular field is an ex-

Figure 1. Kinetic perimetry results from the right eye of a 43-year-old woman with decreased vision for 1 month. Automated perimetry showed a cloverleaf pattern with diffuse constriction bilaterally. The III4e isopter (red) (A) and then the V4e isopter (blue) (B) were plotted in the typical manner. The III4e isopter was then repeated, beginning at the threshold previously plotted for the original III4e isopter and moved slowly toward fixation (green) (C). D, The final kinetic perimetry results show a target visual field.

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Figure 2. Repeated III4e kinetic perimetry results in patients with organic vs nonorganic visual field loss. A, Results from the right eye of a 69-year-old man with a history of primary open-angle glaucoma and a superior arcuate defect worse nasally. B, Results from the left eye of a 56-year-old woman with a history of nonarteritic anterior ischemic optic neuropathy and an inferior altitudinal visual field defect. C, Results from the left eye of a 52-year-old woman with visual loss for 1 year. Automated perimetry showed a 15% false-negative rate and 16/16 fixation losses. A target pattern with a concomitant star-shaped pattern is present on kinetic perimetry. D, Results from the left eye of a 77-year-old woman with visual loss for 1 month. Automated perimetry showed a 95% false-negative rate with 15/15 fixation losses. A target pattern is noted on kinetic perimetry.

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Author Contributions: Dr Foroozan had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Financial Disclosure: None reported.


COMMENTS AND OPINIONS

Topical Antibiotics to Reduce the Risk of Endophthalmitis After Intravitreal Injection?

The article by Bhavsar et al is most important, as there is a lack of prospective studies assessing the necessity of antibiotics after intravitreal injection. However, if the endophthalmitis were to occur in the disgruntled