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AMERICAN ACADEMY OF NEUROLOGY

DIAGNOSTIC ACCURACY OF CONFRONTATION VISUAL FIELD TESTS

To the Editor: The diagnostic accuracy of confrontation visual fields was recently assessed by Kerr et al.,[1] adding to the growing literature on evidence-based physical examination.

The authors compared several common techniques with automated perimetry among patients recruited from a neuro-ophthalmology clinic. The authors concluded that confrontation techniques are fairly insensitive to detect visual field defects. However, the relevance of these findings to a general neurologist is limited by the high prevalence of visual field defects in the study population.

A general neurologist often performs confrontation visual fields as part of a comprehensive examina-

Figure	Reliability of confrontation visual field testing under simulated conditions with low disease prevalence

(A) Synopsis of results from the study by Kerr et al.[1] showing the distribution of normal and abnormal test results from both confrontation techniques and automated perimetry. A majority of patients had abnormal fields on perimetry with a prevalence of 58%. The numbers shown represent patients in whom confrontation techniques yielded true negative (TN), true positive (TP), false negative (FN), and false positive (FP) results. In this study population, the negative predictive value (NPV) of a normal confrontation visual field assessment is only 58%. (B) Simulated results of confrontation visual field assessments in a patient population with 10% prevalence of field defects. The sensitivity and specificity of the confrontation techniques remain constant across patient populations. Using these ratios, the expected numbers of TN, TP, FN, and FP results can be determined. Finally, the NPV of the screening confrontation visual field test in this simulated patient population can be calculated: it is considerably higher at 94%.

tion to screen for neurologic visual loss. The prevalence of visual field defects in this population is generally low. An ideal screening test in this circumstance should have a high negative predicative value (NPV), so that a negative result may confidently exclude a true abnormality.

We simulated the performance of confrontation visual field testing in a study population with low (10%) prevalence of visual field defects, which is more representative of patients in general neurology clinics (figure). We retained the sensitivity and specificity for these techniques that Kerr et al. found in their study since these test characteristics do not vary across patient populations. We demonstrated that the same techniques would have a considerably higher NPV (94%) in this simulated population.

Thus, in a population of patients more likely to be encountered by a general neurologist, the commonly used confrontation visual field techniques exclude visual field defects with relatively high accuracy. In this setting, the neurologist can confidently use these tools for their intended purpose as screening tests.

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Reply from the Authors: To express the diagnostic accuracy of confrontation visual fields in a population with a low prevalence, likelihood ratios (LR) can be calculated. We calculated the LR for our dataset as well as the simulated dataset that Prasad and Cohen prepared.

For our dataset, LR for a positive test is 1.16 (95% confidence interval [CI] 1.03–1.2) and for a negative test is 1.98 (1.19–3.30). In the simulated data set, the LR for a positive test is 1.12 (0.96–1.31) and for a negative test 1.72 (0.67–4.38). There is substantial overlap in the CIs. Tests where the LR lie close to 1 have little practical significance as the post-test probability (odds) does not greatly differ from the pretest probability, and not useful for screening purposes.[2] If the positive LR is greater than 5 or the negative LR is less than 0.2 (i.e., 1/5), then they can be applied to the pretest probability of a patient having the disease tested to estimate a post-test probability of the existing disease state.

In our study dataset, the negative predicted value is 0.59 (95% CI 0.44–0.72) and in Dr. Prasad's simulation is 0.94 (0.85–0.98). The positive predictive value (PPV) is 0.62 (0.55–0.68) and 0.11 (0.07–0.16), respectively. The wide CIs and very low PPV for both scenarios suggest using the instrument in either cohort of patients for ruling in disease would be impractical.

Another consideration is to see how changing the prior probability of disease affects the post-test probability of disease given the LR. Applying Fagan's[3] nomogram to the LR shows very little difference between the pre- and post-test probability and graphically demonstrates this post-testing across a range of potential disease populations.

Despite a lower prevalence of visual field defects in a general neurology clinic, confrontation visual field tests have significant limitations for use as screening tests for visual field defects.

Helen V. Danesh-Meyer, Greg D. Gamble, Auckland, New Zealand

Disclosure: See original article for full disclosure list.

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PROTOCADHERIN 19 MUTATIONS IN GIRLS WITH INFANTILE-ONSET EPILEPSY

To the Editor: Marini et al.[1] reported a series of girls with early-onset epilepsy and found *PCDH19* mutations in 11% of probands. They concluded that 62% of them had Dravet syndrome (DS). We reported *PCDH19* mutations in a series of patients with DS with no *SCN1A* mutation.[2] The patients reported by Marini et al. had earlier onset, status epilepticus at onset, and myoclonic seizures and absences, which defines a phenotype even more suggestive of DS than we observed. However, the findings of Marini et al. confirm our previous report of a possible milder phenotype in patients with DS with *PCDH19* mutations.

Their refined assessment considers the course of the disease permitting the molecular genetics strategy as more effective. In addition, it considers the incidence of seizures in clusters, lack of photosensitivity, a progressive decrease of seizure frequency, and a milder cognitive delay. These findings may indicate that a *PCDH19* mutation is more likely than *SCN1A* mutation in girls.

In our patients with DS and *PCDH19* mutations, similar to patients with *SCN1A* mutations, we found good response to stiripentol, valproate, and clobazam and a worsening with vigabatrin, lamotrigine, and carbamazepine (unpublished data). Since the response to treatment is similar, the only difference is that the clinician must retain genetic counseling at diagnosis. For example, autosomal dominant transmission with frequent de novo mutations vs an unusual mode of transmission via a possible inactivation of the X should be considered.[2]

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