Comment: Diagnosing stroke in acute dizziness—Do the "eyes" still have it?

In this issue of *Neurology*®, Kerber et al.[1] describe 272 emergency department patients with acute, continuous dizziness and nystagmus or gait unsteadiness, 29 (11%) with strokes by MRI neuroimaging. Their population is similar to those described previously as the acute vestibular syndrome (AVS).[2] The authors compare clinical features (ABCD[2] [age, blood pressure, clinical features, duration, and diabetes] risk score, general neurologic examination, and head impulse, nystagmus pattern, test of skew [HINTS][2] eye movement tests) in stroke and nonstroke patients. They contend that no single examination "can identify a sufficiently low-risk group" to rule out stroke in AVS. They suggest instead a mathematical modeling approach combining all of these factors to identify a very low-risk population (86 [32%] without stroke).

At first glance, this appears to be an important result contradicting prior studies demonstrating high accuracy for eye movement–based diagnosis in AVS (99% sensitivity, 97% specificity).[2,3] There are 3 major reasons for this apparent discrepancy:

1. Low-quality eye movement examinations with mixed-skill raters and only fair interrater agreement. There were no quantitative recordings used to validate clinical examinations. Kappas were low (0.24–0.40). With discrepant examinations, the first examiner's result was used, even if contradicted by an expert neuro-otologist reviewing a videotape of the original eye examination.
2. Classifying dangerous nonstroke central lesions with peripheral vestibular disease. The HINTS approach in AVS differentiates peripheral from central lesions, regardless of etiology. Although Kerber et al. count this as a "bug" (lowering HINTS specificity for stroke), most clinicians would view this as a "feature" (avoiding missing important central lesions such as cerebellar tumor).
3. Using eye movements in the wrong patients. HINTS should only be applied in AVS patients *with* nystagmus.[3] The authors include AVS *without* nystagmus and count cases due to stroke against the eye movement approach.

Methodologic and analytic disadvantages to eye movement examinations notwithstanding, Kerber et al. still found HINTS to be the strongest predictor of stroke in their model. In fact, they found that HINTS identified 20 of 22 (90%) of causal (nonincidental) strokes when applied to the correct patients, despite inconsistent eye examinations from nonexpert raters. Overall, these findings suggest "the eyes still have it."

1. Kerber KA, Meurer WJ, Brown DL, et al. Stroke risk stratification in acute dizziness presentations: a prospective imaging-based study. Neurology 2015;85:xx–xx.
2. Kattah JC, Talkad AV, Wang DZ, Hsieh YH, Newman-Toker DE. HINTS to diagnose stroke in the acute vestibular syndrome: three-step bedside oculomotor examination more sensitive than early MRI diffusion-weighted imaging. Stroke 2009;40:3504–3510.
3. Newman-Toker DE, Kerber KA, Hsieh YH, et al. HINTS outperforms ABCD2 to screen for stroke in acute continuous vertigo and dizziness. Acad Emerg Med 2013;20:986–996.

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