Eye Signs Flag Stroke in Vestibular Syndrome

**BY JEFF EVANS**

**BALTIMORE** — A test battery of three oculomotor signs for patients with acute vestibular syndrome can detect stroke with greater sensitivity than does MRI with diffusion-weighted imaging in the first 24-48 hours after symptom onset, according to a prospective, cross-sectional study.

If the results are confirmed in a larger, multicenter study, they will help determine which patients with acute vestibular syndrome (AVS) should undergo MRI scanning, Dr. David E. Newman-Toker said at the annual meeting of the American Neurological Association.

MRI scanning of all patients with AVS is “probably an unrealistic strategy” for diagnosis, said Dr. Newman-Toker of the departments of neurology and ophthalmology at Johns Hopkins University, Baltimore.

Of 2.6 million visits to the emergency department for dizziness each year, about 5% (or 100,000-150,000 people) have a cerebrovascular event, mostly in the lateral brainstem or the inferior cerebellum (Mayo Clin. Proc. 2008;83:765-75). Of that 5%, evidence suggests that approximately 35% may be misdiagnosed, which is a much higher rate than with other types of stroke (Stroke 2006;37:2484-7). Another study reported that around 40% of these misdiagnoses culminate in death or disability.

Strokes in the lateral brainstem or the inferior cerebellum frequently mimic benign vestibular disorders, such as vestibular neuritis or labyrinthitis, which are collectively known as acute peripheral vestibulopathies.

To determine if a battery of bedside oculomotor signs could detect patients with stroke with greater accuracy than did early MRI with diffusion-weighted imaging (DWI), the investigators prospectively enrolled 101 patients during 1999-2008 who presented with AVS to an urban academic acute stroke referral center. AVS is a rapid onset of a new persistent dizziness or vertigo that is sustained for 12-24 hours with some degree of gait unsteadiness, in association with head-motion intolerance and nystagmus, nausea, and vomiting.

The patients were admitted either through the academic medical center’s emergency department or by transfer from other hospitals. They only included patients who had at least one risk factor for stroke.

Each patient underwent MRI scanning with DWI, which was repeated if the initial MRI was negative but oculomotor and other neurologic signs indicated stroke. “This distinguishes this study from every other study to date on this issue, where it was assumed that the initial MRI scan in those studies was accurate, which was not necessarily a safe assumption,” Dr. Newman-Toker said.

One investigator performed the test battery for oculomotor signs of stroke—given the mnemonic HINTS: head impulse test, nystagmus, and test of skew.

These are assessed by performing a horizontal head impulse test (a test of vestibulo-ocular reflex function), a test for direction-changing nystagmus, and an alternating cover test to test for skew deviation. The results of each test have been individually associated with stroke in AVS (Stroke 2009;40:3504-10).

Men accounted for 65% of the enrolled patients, who had a mean age of 62 years. Most patients (76%) had two or more stroke risk factors, “so this was a very high risk for stroke population,” he noted.

Three-fourths of the patients were examined within 24 hours of symptom onset and about 70% underwent an MRI scan within 6 hours of their bedside exam. A single examiner, who was blinded only to the MRI findings, performed all of the neurologic exams.

Based on the reference standard of MRI with DWI for diagnosis, 25 patients had peripheral vestibulopathy (vestibular neuritis or labyrinthitis) and 76 had central brain pathology (69 ischemic strokes, 4 hemorrhages, 2 demyelinating diseases, and 1 acute intoxication with an anti-convulsant).

Testing for HINTS to INFARCT (Impulse Normal, Fast-Phase Alternating, or Horizontal Counter Rotating) in stroke at admission with 100% sensitivity and 96% specificity. In contrast, an initial MRI with DWI detected stroke with 88% sensitivity and 100% specificity. The use of any obvious neurologic signs for detecting stroke (such as limb ataxia, severe truncal ataxia, hemiparesis, or gaze palsy) provided a sensitivity of 64% with 100% specificity. General neurologic signs had only 19% sensitivity and 100% specificity. A normal horizontal head impulse test was the best single pretest stroke and a vertical nystagmus test with 33% sensitivity and 100% specificity, although it misses lateral pontine strokes because the reflex pathway tracks from the inner ear straight to the pons.

Peripheral vestibulopathies occurred in patients with an abnormal head impulse test, direction-fixed nystagmus, and no skew deviation.

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Electric Stimulation Improves Swallow Function After Stroke

**BY PATRICE WENDLING**

**CHICAGO** — Electrically stimulating the swallowing apparatus at the back of the throat improves swallowing function and speeds the recovery of normal feeding in patients with dysphagia following stroke, according to a small, randomized trial.

Dysphagia is common after stroke and is a risk factor for disruption of normal eating patterns, need for artificial feeding, and aspiration pneumonia. Patients with dysphagia may require frequent hospitalizations for pneumonia, prolonged hospital stays, and increased need for institutionalized care.

The management of dysphagia has thus far failed to provide reliable, effective rehabilitation for these patients, according to Dr. Vanoo Jayasekeran and his colleagues ran a prospective, cross-sectional study of 357 patients who underwent various cardiac surgery procedures with cardiopulmonary bypass at Johns Hopkins Hospital and compared them with the outcomes of 714 control patients matched by age range, gender, and type and year of surgery.

The patients had a mean age of 65 years, and 59% in each group were men. Comparing postoperative stroke rates, control patients were significantly more likely to have hypertension (77% vs. 68%) and peripheral vascular disease (20% vs. 16%). The stroke and control groups had similar rates of diabetes mellitus (30% vs. 25%, respectively), history of myocardial infarction (37% vs. 32%), and hypertension (49% vs. 45%).

In a conditional logistic regression analysis, the investigators found that, for each 1 g/dL decline in hemoglobin, the odds of having a stroke significantly increased by 37% (P < 0.001). Patients with a postoperative hemoglobin level below the group median of 8.8 g/dL had a 78% greater chance of having a stroke than did those above the median. (Normal hemoglobin levels are greater than 13 g/dL in men and greater than 12 g/dL in women.) Postoperative hemoglobin levels were below the median in significantly more patients who had a new stroke (37%) than in those who did not have a stroke (41%).

The association between stroke and post-cardiopulmonary bypass hemoglobin could be the result of hemodilution or cerebral hypoperfusion,” Dr. Gottesman and her associates suggested. Studies are needed to determine whether normalizing hemoglobin levels would decrease the risk of stroke.

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Low Postsurgery Hemoglobin Level Raises Risk for Stroke